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APRIL 1951
25 CENTS



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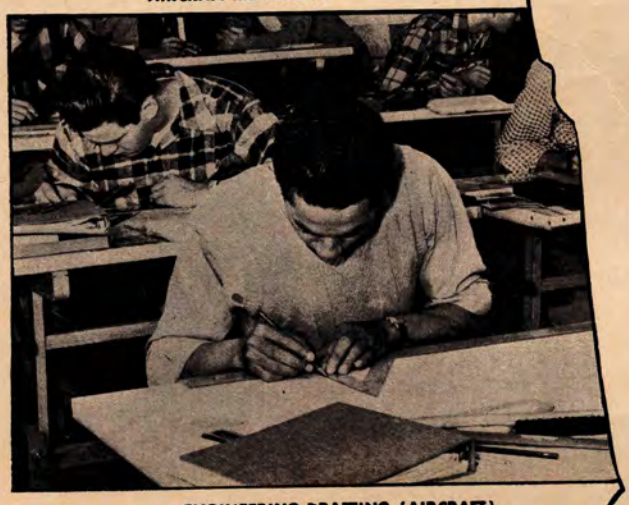
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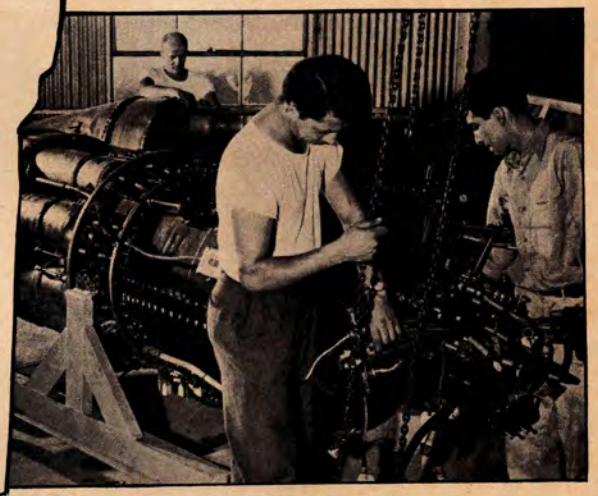
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AIR TRAILS The Leading Magazine of Air Progress and Aeromodeling

April, 1951

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THE READERS WRITE: All Communications to the Air Trails editorial offices should be addressed to Air Trails, 304 E. 45th St., New York 17, N. Y.

Photo Credit . . . That was a swell picture you had as an opener in your Model Annual showing team racers ready to go. Who took it and where?

Peter Franklin, Ithaca, N. Y.

• The photo was taken by one of Plymouth's photographers at the 1950 International Model Airplane Championship Contest in Detroit.

Going Back to Arabia, Sgt.? . . . Enjoyed Betty Skelton's "Girl vs. Airplane" and most of all Bill Brennand's "How I Won the Goodyear."

But most private pilots would like to see what these airplanes entered in the Goodyear look like in more pits than given.

I would appreciate getting Mr. Pitts' address as I am very interested in his planes. I am a private pilot and am planning on buying my own airplane as soon as I get back to the U. S. I am stationed in Saudi Arabia, where the American & Arabian Oil Company is also located and where there is a great deal of flying with this company.

Sgt. B. L. Willoughby

• Did you see our February 1950 issue? It contained a complete presentation of three-view drawings of all Goodyear midgets participating in the previous National Air Races. Address Curtiss Pitts at Box 2815, University Station, Gainesville, Fla.

Woman's Angle . . . Now, that new department I like. Your (Miss?) Horton sounds like quite a flyer. But how about a BIGGER picture of the author-photographer-pilot?—*C. M. Cook, Ft. Smith, Ark.*



• Yes, it's *Miss* Horton. Herewith a photo by Peter Basch, noted NYC lensman.

Climb Aboard the Boxcar . . . The Battling Boxcar featured in the current Air Trails Model Annual for 1951 certainly turns in high performance and has a slow easy glide. I think it is the ideal plane for the beginner and expert, thanks to Struhl's designing.

Ray Ferguson, Mexico, Mo.

Berlin Wants R-C Dope . . . By the courtesy of a G.I. I recently saw some issues of your fine magazine. Since we over here don't have any postwar model clubs yet (as far as Berlin is concerned) there is no way of getting ideas about radio control equipment.

I'm holder of the amateur radio license DL7AH and would like to get in touch with some experienced modelist who knows some hints and kinks about radio control of gas models. Can you put me in touch with some serious fellow?

Harry Lilienthal, Berlin-Britz, 33 Gielower Strasse, U. S. Sector, Germany

For Union of Flight Engineers . . . In a recent issue there was an article on flight engineering in your series about jobs in aviation. I would like to acquire a copy to read at our next flight engineer union meeting.

Wm. W. B. Crickman, Greenlawn, N. Y.

To Build a Midget Racer . . . My father and I are interested in the midget air races and midget planes. In one of your issues I read that the NAA has a complete bulletin on the midget planes of the Goodyear Race. How could I get one?

I have been a model builder for several years, and have flown with my father in his Champion a lot. I may, with his help, financially and otherwise, attempt to build a lightplane of the Knight Twister or Wittman Buster type. Are there any books that tell about lightplane construction?

Lowell L. Gamble, Buchanan, Mich.

• A booklet on regulations concerning structure, performance and physical characteristics of midget racing planes is published and distributed by the National Aeronautic Association, 1029 Connecticut Ave., Washington 6, D. C.

For a list of publications dealing with aircraft structure, we suggest you write to the Civil Aeronautics Administration, Office of Aviation Information, Washington 25, D. C.

Towline Sailplane Man . . . In checking the index you published listing all the material published for the year 1950, lo and behold I noticed there had not been that first plan for a good towline sailplane. This rather grieves me as I am a towline fan and along with others look forward to seeing a set of plans now and then for a good sharp-looking and sharp-flying sailplane model. . . .

Towline sailplanes are a low-cost form of flying, and just as much fun to build and fly as a gas model. During World War II towliners came into the limelight as modelers turned to something they could build. With the end of the war they headed for the U-control field, and towliners, the phase that kept modeling alive when everything was hard to get, were forgotten.

There are still a few die-hards who believe in it and will stick by it as evidenced by the breakdown of the 1950 Nationals with towliners having 6 percent of the pie

Clifford E. Osborne, Chillicothe, Ohio

• We hope you saw the Feb. 1951 issue, Cliff. It featured a neat towline job, "Javelin Glider," by Ray Jessop.

Library of Full-Size Plans . . . In behalf of my club I am interested in gaining information on the possibilities of receiving the monthly Air Trails plans as a subscription. We are starting a library of them and would like to receive them regularly.

Dick Withycombe, McMinnville, Ore.

• Plans are available only by ordering with coupon order form found in each issue of AT. No subscription service exists for AT's full-size plans.

The Mooney for '51 . . . Of all the articles printed about the Mooney airplane last year, the article by Mr. Sid Goldin was the most outstanding, true-to-fact piece that hit the pages of the leading aviation publications.

Since it was published, the 1950 model, powered by a Continental engine, has been establishing quite a reputation, and now the 1951 model is even more improved than the others. It would be deeply appreciated if we could have another of these *impartial* articles by Mr. Goldin—this time on the '51 model now being built. I believe Mr. Goldin, and your readers, have a pleasant surprise in store for them after flying the '51.

M. S. Heyward, Atlanta, Ga.

Up the Flying Saucer Pilots! . . . *Dear Alex Dawydoff:* Things like the clipping below, taken from an issue of "Astounding Science Fiction" magazine, have caused me no end of trouble. Your many fans hereabouts bring stuff like this to me for an explanation. How should I know what this is all about? I explain to them that Dawydoff drives fast and fancy automobiles, flies sailplanes, eats borscht, drinks various concoctions and the Lord knows what else—so there is no telling, and why don't they write their man and ask him what gives.

E. J. Reeves, Texas Soaring Association, Grand Prairie, Tex.



Courtesy: General Electric Aircraft Turbine Division

• *Dear E. J.:* Please accept my most humble apologies for the trouble caused by my many sideline activities. I assure you they are not as hair-raising as they may appear on the surface. I have long ago abandoned the consumption of borscht because the grade of vodka obtainable here is not sufficiently strong (under 200 proof) to cut the fatty content of the moujik soup. Though I do pride myself on my fast and fancy automobile, which overheats in summer and turns me into an icicle in winter, I would like to point out that your honorable Contest Director, one William Coverdale, encases his elegant form in the no less elegant XK-120 Jaguar.

(*Continued on page 9*)

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Flivver 24"	B-C	3.95
Fly Boy 24"	AA-A-B	1.00
Flying Circus Jr. 16"	AA	1.50
Flying Clown 28"	A-B-C	1.95
Flying Saucer 18"	A-B	1.95
Freshman 9 24"	A	2.49
Freshman 19 30"	A	2.95
Freshman 29 36"	B	3.98
Hell—Razor 14"	A	5.95
Hell—Razor 15"	B	6.50
Hell-Razor 18"	D	6.95
Hot Dog 17"	A-B	2.00
Howard 'Ike' 24"	B-C	2.95
Infant Wagon 20"	AA	1.95
Invader A 11"		5.95
Invader B 17"		7.95
Junior Stunt 9 27"	AA-A	3.48
Junior Stunt 19 34"	A	3.98
Junior Stunt 29 40"	B	4.98
Key—Det 18"	AA-A	2.95
Kingpin 28"	A-B	3.95
Knockout 18"	AA	2.50
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Little Devil 18"	AA-A	1.50
Little Mustang 18"	(AA)	1.95
Little Schmoe 17"	AA	1.50
Lockheed Little Dipper 22"	AA	2.98

BURIED IN THIS AD are most of the new items. Sometimes there isn't time or space to include them. But, if available, we have it.

ACCESSORIES

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Per Ignition	Pts	Qts
Ohlson #1, #3	.75	1.40
Power Mist #4	.65	—
Reg. Pink	—	1.25
For Glo		
Ohlson #2, #4	.75	1.40
Ohlson AA	.75	—
Ohlson #5 or #4 Exon.	.95	—
Powermist Glo	.90	—
Powermist Spitfire	—	1.55
Ranger Glo	.80	—
Testors 29	.75	—
Dynaglo	.75	—
Ranger AA	.80	—
Spitfire AA	.80	—
Blue Blazer #1	.65	—
Blue Blazer #2	.75	—
QK Cub	.55	—
Trixtey	.65	—
For Diesel		
Drone	—	1.10
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Veco 4" 3p. 4p. 7" 4p. 5p. 8" 5p. 6p. 9" 6p. 7p (6"-25c; 7" & 8"-30c; 9" & 10"-35c)		.50
Also Ohlson. Flo-Torque, Garday		
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Universal Running Blocks		1.50
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Dale Stunt Tanks—All Sizes		.65
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#2—2 1/2x1 1/2x3/4	#6—1 1/2x1 3/4x1	
#3—2 1/2x1 3/4x1	#12—3 1/2x1 1/2x3/4	
#15—2 1/2x1 1/2x3/4		
Proms: 1 1/4x1 1/4 or 2 hor. or ver.		.50
1 1/4x1 3/4x2 Sq.		.50
1 3/4x 3/4x2 1/2 Wedge		.50
1 3/4x1 1/2x3/4 1/2-Rnd Stunt		.50
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O.K. 1.50 Wico 1.95		
O.K. Twin .. 2.00		
Competitor — 1.95		
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Ohlson Glo (V, V2 or AA)		.65
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2 1/4" — 1.25 3" 1.75		
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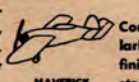


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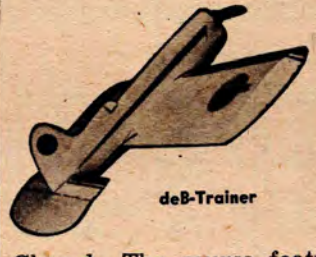
A 16″ span speedster, one of the very few true speed models available for Half-A flying is Cleveland Model & Supply Co's *Baby Topper* (Topper I). Every part has been sawn to shape and all the modeler has to do is round edges and sand smooth, a fast operation, says CM&SC, with the soft "carve-quality" balsa supplied. With the newly announced price cut of 25% in force on the *Baby Topper* the kit now sells for 75c. . . . New stunt plane for larger size motors is the *Viking* by F-B Model Aircraft Co. Takes Class C and D powerplants. Boasts 550 square inch wing area; fuselage prefabbed; kit features die-cut parts. *Viking's* span is 51 inches, the wing chord is 11 inches. . . . As a departure from its original policy of designing kits for the expert groups, deBolt Model Engineering Co. has come up with a new series of *All American Models*, the first of which is the $1.75 *All American Trainer*. Says Harold deBolt, "The construction and flyability of these models will be in a graduated scale so that they match the modeler's ability as he progresses up the ladder. The *Trainer* is of the simplest possible construction and falls into the Half-A class using O.K. *Cub* engines." Kit is ready to assemble with shaped wing, fuselage and tail parts. . . . A home-study course in aircraft overhaul, repair, inspection and maintenance is McGraw-Hill Book Co's 3-volume set *Basic Aircraft Mechanics* written by the Technical Development Staff of the Northrop Aeronautical Institute and edited by Charles Edward Chapel. The course features more than 2,000 illustrations, has 1,247 pages and scores of trouble-shooting charts and work procedures. It presents both theory and practice, the best methods and techniques covering everything from the operation to the overhaul of all major aircraft engines and parts. . . . As the 4th kit in the Testor program of an integrated series of models for any one size of engine, the Testor Chemical Co. has introduced its *Senior* in three sizes for .09, .19 and .29 powerplants and especially McCoy motors. An unusually interesting feature is the molded fuselage halves for each *Senior*. These are pre-formed balsa.

(*Continued on page* 10)





Viking



deB-Trainer



McG-Books

Veco PRODUCTS

"The Champions' Boast From Coast to Coast!"

CONTROLINE KITS
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- Warrior
- Chief
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- Dakota
- Sioux
- Taylor Cub



CHIEF

Engines • Planes
Propellers • Wheels • Accessories

HENRY ENGINEERING CO.
Burbank, California



(*Continued from page 4*)

As to the reference permitting me to flit here and yon in flying crockery, I yet do not understand what caused the Venians (inhabitants of the planet Venus, who allegedly are responsible for the appearance of the so-called "Saucers," "Disks" or what have you) to choose me as their mentor. You may have heard that these flying enigmas have run into trouble over certain sections of our land where there is a fault in the magnetic line of forces used by them for propulsion, with the result that some of them have crashed.

The Saucer pilots, having flown frequently over the State of Texas, no doubt have spotted the soaring activities of TSA, and it has dawned on them that here was their solution to overcome embarrassing power failure in the region of magnetic faults.

I yet cannot imagine the identity of the jerk who recommended me to teach them soaring technique, but I was suddenly summoned into their presence and forced to act as their soaring instructor under penalty of having me Bovril supply cut off.

Alexis Dawydoff, Air Trails

Wing Floats as Fuel Tanks . . . In a recent issue you had a picture of the Grumman SA-16A, an amphibian equipped with auxiliary wing tanks. Could you tell me why wing floats can't be used as fuel tanks and not cause extra drag?

R. J. Fechter, Santa Monica, Calif.

● In the Air Notes column of the February issue you may since have noted that mention was made of a flight by three Grumman SA-16A's from San Francisco to Hawaii. The item stated that in order to extend the range, fuel was carried in wing floats.

PBY's Speed . . . In a recent Air Progress section by Douglas Rolfe he describes the Consolidated Catalina (PBY-5A) as having a "comparatively slow 180-95 mph." This is an error and an understatement.

I flew P-boats for three years in the Navy with VPB-73, flying PBY-5A's of the type described. Never in the entire time did any pilot of our squadron come close to achieving such speeds. On take-offs and landings we flew at 90 to 95 knots. On patrols and sweeps we averaged about the same 90 to 95 knots, many times flying at 85. When we were really winding up in high-speed bombing runs we blazed along at 120 knots, which was really scorching. Even in the lightly loaded training P-boats, I never heard of any pilot achieving the speeds you quote.

We used to laugh at the descriptions of ships given in recognition manuals when they used to state that the speeds of the Catalina were those you gave. . . . Furthermore, the powerplants were 1,275 hp, not 1,200.

R. L. Carlisle, Norfolk, Neb.

● With knots converted into mph (a knot being 1.15 statute miles), it would still seem Doug Rolfe has been reading one of those same manuals! But the "error" is widespread, and the difference in speeds accorded PBY's may partly be due to failure to specify the altitude—higher speeds, of course, being obtainable at higher altitudes. And even "Jane's All the World's Aircraft for 1943" lists the max. speed of the PBY-5 at 7,500 ft. as 196 mph.

47's vs. 51's—He Flew Both . . . After reading the letter by M. C. Olmstead, the former crew chief, commenting on the F-47 (formerly P-47), I had to answer. His analysis gives a distorted view of the performance of both the F-47 and the F-51. I agree that the 47 was a top ground support plane, better in that respect than the 51.

In speed comes the argument. Up to 25,000 feet the 51 has up to a 60 mph edge, but above that . . . a Jug could really stop. Once, chasing a Me 410 at 29,000 feet, I indicated 260 mph in a slight climb with both wing tanks on. This figures out close to a true speed of about 410 mph.

On range, I think the 51 and the 47N had about the same. The reason for the lack of 47's in the National Air Races was primarily its high low-altitude fuel consumption and needless high-altitude supercharging.

My authority for all this is some 650-plus hours in 47's and the fact that I now fly 51's.

Lee F. Richason, Grand Rapids, Mich.

. . . After reading Mr. Olmstead's letter, I would like to make my contribution to the age-old feud of P-51 vs. P-47. I believe Olmstead underrated the Thunderbolts too much. At 15,000 feet I would give the Mustangs the edge in speed, but at 30,000 feet I would stake my hat that a Thunderbolt could pull away from a Mustang without pressing top speed. This is due mainly to the fact that P-47's were originally used as fighter-bombers.

And that fact can be checked.

I would also stake my hat in saying the Thunderbolts had greater range. I believe it was the Mustangs that were forced to turn back over Holland and France while the Thunderbolts (with the aid of drop tanks) went all the way with the "Forts" into Germany.

This can be checked, too.

I would therefore conclude that the Mustang's greater speeds at lower altitudes was the main reason Thunderbolts were not entered in the Bendix Air Races.

Does all this add up?

Charles S. Cobb III, Rye, N. Y.



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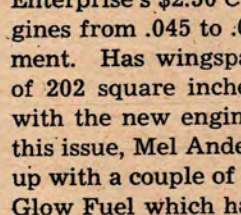
Big brother to Joy Products Co.'s *Stunt Runt* is the concern's new *Super Stunt Runt* (Simplikit #5) for .09 engines. All parts are pre-shaped, kit has airfoiled wings and the model is considered capable of flying the full stunt pattern. Wingspan is 20 inches; the fuselage length, 17 inches. Priced at $1.95. Joy has companion ship, a free flighter, of 31 inch span for Half-A engines. This is the *Nomad;* tagged at $1.50. . . . Latest to join the long line of "Old Timers" miniature auto kits made by Scranton Hobby Center is the 1906 Locomobile known affectionately as "Old 16." Scranton's model was scaled directly from a Locomobile still in good running shape owned by the well-known artist Peter Helck. This is a faithful copy of the car that won the famous Vanderbilt Cup. Scale is ¾" to the ft. Length is 10 inches. Cost? $3.95. . . . That there free flight job is Enterprise's $2.50 *Champion 36.* Takes engines from .045 to .099 cubic inch displacement. Has wingspan of 3 feet; wing area of 202 square inches. $2.50. . . . Together with the new engine covered elsewhere in this issue, Mel Anderson Mfg. Co. has come up with a couple of other additions to the line. One is the *Spitzy* Nitromic Glow Fuel which has an anti-friction additive which imparts a cleaning action during engine operation. The other is the *Spitfire Tornado* miniature Indianapolis racer made of durable fuel-proof colored plastic. Completely assembled and ready to run, the racer features a *Spitfire* .045 engine and fuel tank, reduction gear unit, control cable center post, bridle and control cable—all $9.95 with a pint of the glow fuel. The car comes with a flywheel and starting cord as well as the glow plug, clip and battery plug-ins. With the reduction gear unit included the car runs about 15 mph which is a scale 75 mph. High speed gears are available.



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The new thing for 1951 is ½A payload flying. It has caught on fast since the Dallas Nationals. The new ½A PAA Load Event is for free flight gas models powered by engines of not exceeding .050 cubic inches displacement and carrying a three-ounce dummy occupant (not the two-ounce dummy used at Dallas). Read the rules carefully to be sure you qualify.

Another change for 1951 is the combination of Classes A and B. A models with eight-ounce loads and B models with sixteen ounces get an even break. Attractive cash prizes. See 1951 rules for details.

In addition, A Model Clipper Cargo Event is open this year (at the Nationals only) to contestants of all ages. The winner will be the entry carrying the greatest amount of payload in an official flight and landing it safely with load intact.

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air notes | AVIATION TODAY AND TOMORROW

Jet Connies. Trans World Airlines are equipping their Model 749 and 749A Constellations with a jet exhaust system which will add 11 mph to Connie's speed at operational altitudes. Developed by Lockheed Aircraft Corp. in kit form, the system fits exhaust collector rings of the R-3350 Wright engines and has ten stacks instead of the present two. Besides adding to plane's speed it also provides better cooling, saves gas, increases range and payload.

GM Thunderjets. General Motors Corp. will soon go into production of the Republic F-84 Thunderjet in its Buick-Oldsmobile-Pontiac Assembly plants. Assembly of automobiles will be continued indefinitely, gradually diminishing as tooling for aircraft program gains acceleration.

Old-Timer. Capt. Basil Rowe, top ranking pilot of Pan American World Airways, has probably more flying hours than anyone in the business. When he looked last in his log book the figures in the right corner read 31,450 hours. He is 54 years old and a short while ago returned from a stint of flying Korean airlift between San Francisco and Tokyo.

Word from the Wise. According to Bill Stout, pioneer aircraft designer responsible for the famous tri-motor Ford and now head of Stout Research Laboratory at Phoenix, Arizona, "Never resort to mathematics until you have exhausted the possibilities of two toothpicks and a piece of string." And Bill should know!

Stratotanker. Boeing Airplane Co. has recently modified an Air Force C-97 Stratofreightor to a flying tanker. Modification consisted of installing the Boeing "flying boom" equipment for midair refueling. Operation of fuel pumps and other refueling gear is controlled from special flight-engineer's panel in the control cabin. The letter K in type designation has been assigned to all aircraft which act as flying gas stations. Early refueling tests were done with Boeing B-29's known as KB-29's.

Heap More Push. A new and more powerful version of the Convair B-36D, designated B-36F, is undergoing flight test at Fort Worth, Texas. Plane is equipped with six most-powerful-in-the-world piston engines each developing 3,800 hp, in addition to the four jet pods. In the meantime, the early models of the 36, not equipped with jets, are being modernized to the 36D series, by addition of four jet engines. Top speed of both modernized and production B-36Ds is more than 435 mph, and service ceiling is over 45,000 feet.

Rice from Heaven. Sowing of rice from an airplane is an Australian experiment by Agricultural Control Ltd. A 50-acre plot of land is being used for the project. Seeding is done by a Tiger Moth airplane flying at an altitude of 30 to 40 feet.

Scratch One MIG. First man to shoot down a Russian-built MIG-15 jet fighter in Korea was Lt. Col. Bruce H. Hinton of Stockton, Calif. Col. Hinton was flying his North American F-86 at 25,000 feet in formation with three others when they spotted a brace of MIG's some 15,000 feet below. As the F-86's dived on them the Russian jets started a hard turn, but the Sabres turned inside of them easily. Hinton gave a couple of squirts with his 50's to a MIG in his sights and the enemy craft went down in flames, shedding parts all over the sky. It was all over in a moment. Incidentally, "MIG" which stands for the initials of the plane's designers Mikhoyan and Gourevitch, also means "moment" in Russian. Quite appropriate in this instance.

And Jets by Chrysler. Pratt & Whitney Aircraft is negotiating with the Chrysler Corp. to build, under P&W license, the J-48 Turbo-Wasp engine for the military services. Chrysler will manufacture the engine in a new plant to be constructed in Detroit.

Fences on Wings. You have undoubtedly seen on a number of late swept-wing jet airplanes small vertical plates located on the wings, running from leading to trailing edges. These plates are called "boundary layer fences." Their purpose is to restrict the airflow which, on swept-back wings, moves spanwise toward the tips and causes tip stall. This stall is dangerous when the fighter is landing or doing maneuvers at high speed. By damming up the spanwise airflow the condition is automatically corrected.

Air Evacuation C-54. A special version of the four-engined Douglas, designated as C-54M, has been recently delivered to the Military Air Transport. The plane is designed specifically for quick conversion from standard cargo transport to a special 32-litter air evacuation craft, providing new comfort to sick and wounded military personnel. Among a number of changes, it provides greater vertical space between litters, new heat and ventilation system, oxygen outlets for each patient and automatic system for insect control. This is in accordance with the Department of Defense policy to transport military patients on a world-wide basis by air instead of by water or rail. Thirty C-54M's are on order.

Arctic Helicopter. A helicopter, designed specifically for Arctic rescue, and designated the H-21, was ordered by the U.S. Air Force from Piasecki Helicopter Corp. It will be equipped with the "omniphibious" landing gear which will permit it to land on snow, ice, water, tundra, marsh or land. The gear as well as other various components will be manufactured by Goodyear Aircraft Corp. of Akron, Ohio.

Army Cessnas. Army Field Forces have on order 480 Cessna L-19 liaison planes. The L-19 won last summer the competition staged by the AFF and the AF.

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For most young men between the ages of 18 and 25, the prospect of military service seems very likely but an attitude of "sit-and-wait" is dangerous to the security of our country and to your own personal future. Wise young men are acting *now* to gain the skills that will make them better qualified for better jobs in either military *or* civilian life.

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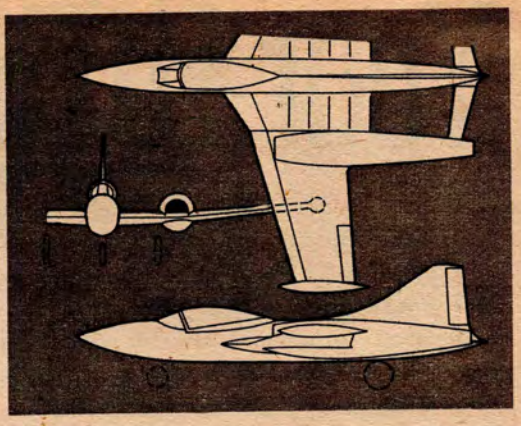
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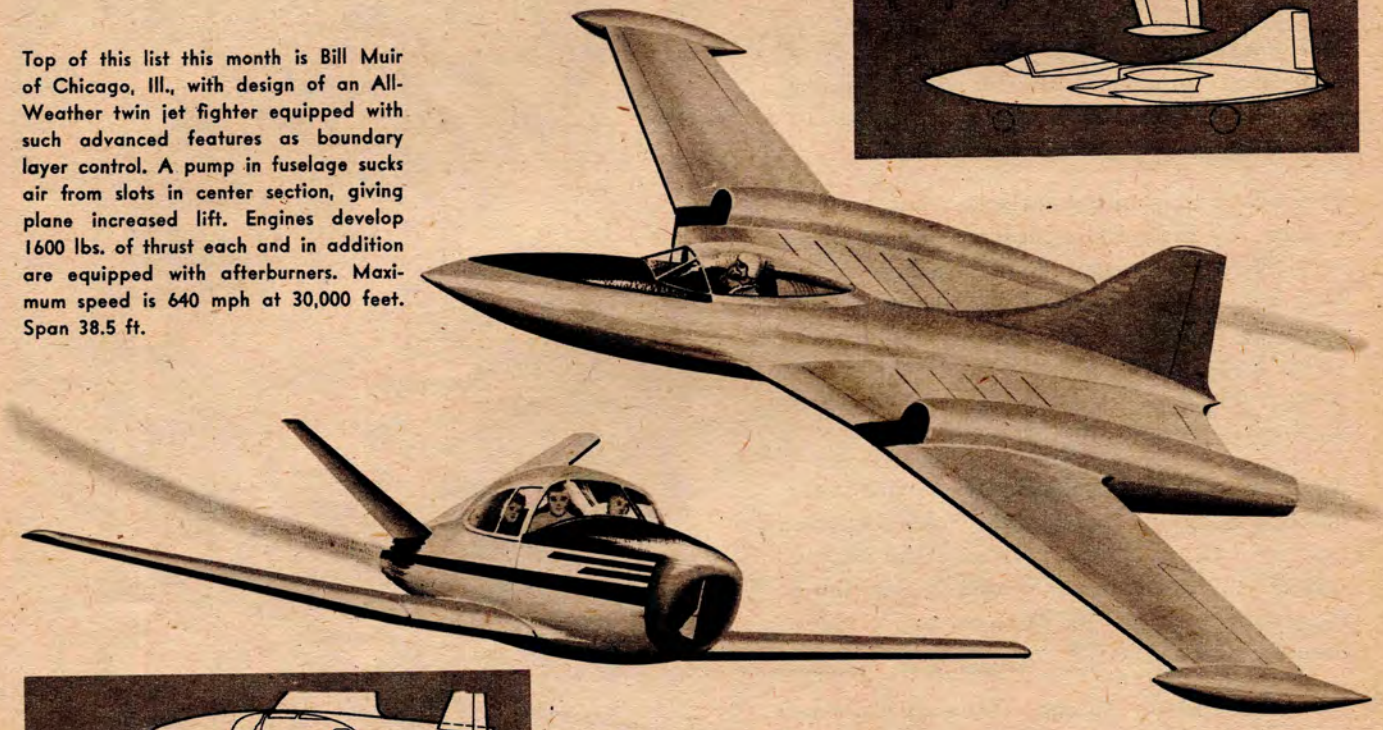
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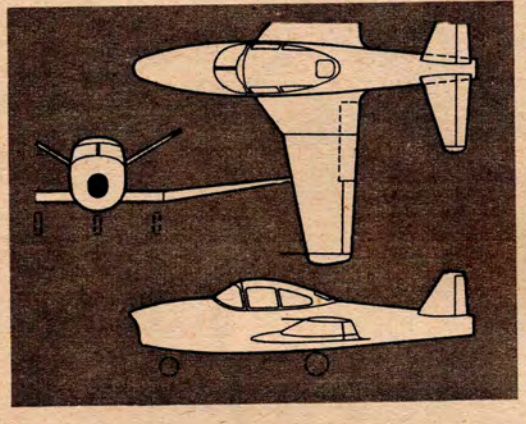
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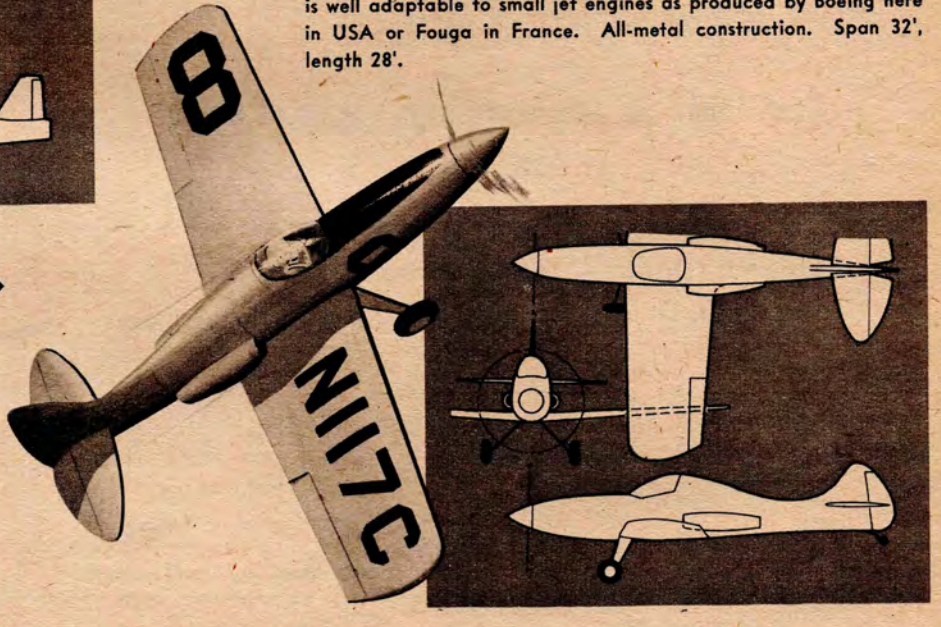
Top of this list this month is Bill Muir of Chicago, Ill., with design of an All-Weather twin jet fighter equipped with such advanced features as boundary layer control. A pump in fuselage sucks air from slots in center section, giving plane increased lift. Engines develop 1600 lbs. of thrust each and in addition are equipped with afterburners. Maximum speed is 640 mph at 30,000 feet. Span 38.5 ft.



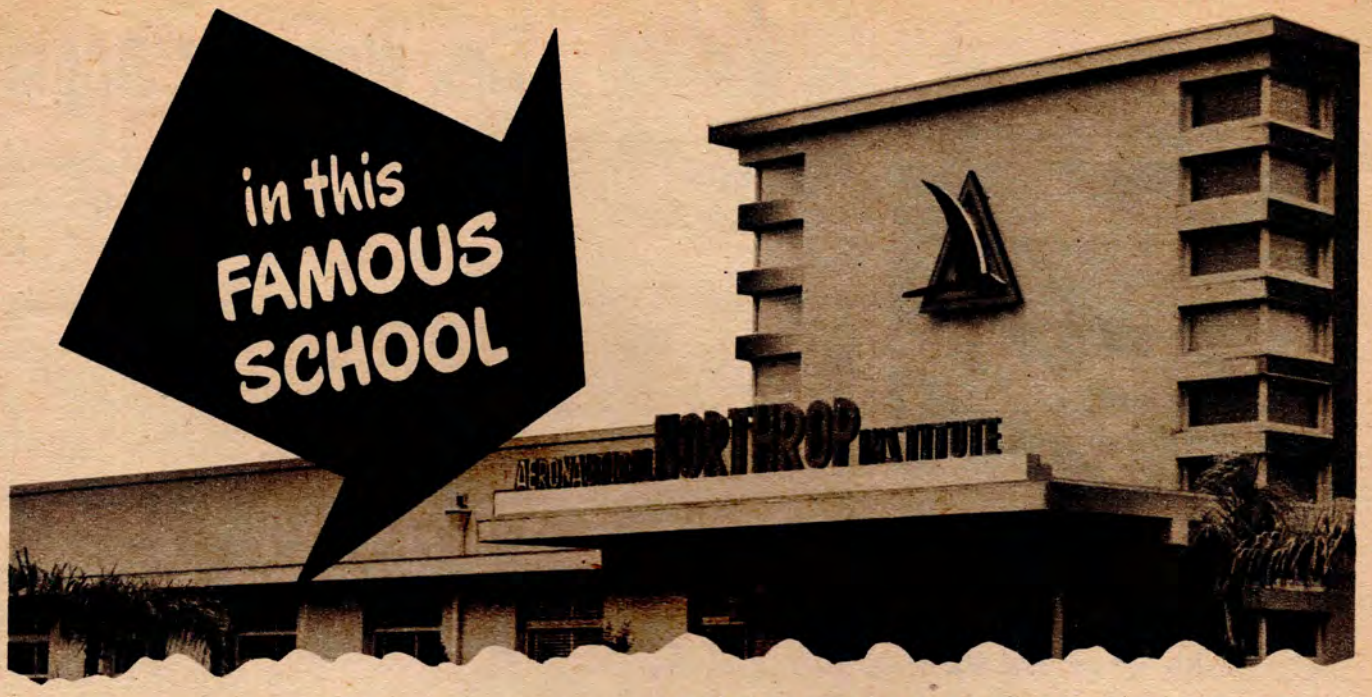


Here's a neat personal plane powered by a jet engine by Paul W. Berlo of Gardner, Mass. It is well-balanced design and one which should have a good performance and flying characteristics. It is well adaptable to small jet engines as produced by Boeing here in USA or Fouga in France. All-metal construction. Span 32', length 28'.

R. J. Raymond of Chicago, Ill., comes up with an unusual 190 cu. in. displacement midget racing plane. The engine of ship is located behind the pilot, driving a propeller through a long shaft. Very interesting and makes for excellent streamline, but presents a sticky problem in balancing. Also, experience with long extension shafts has not been very happy. Cooling is through ducts at side of fuselage.

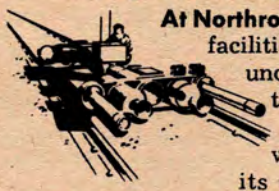


Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½ x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of $25. Payments of $5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.



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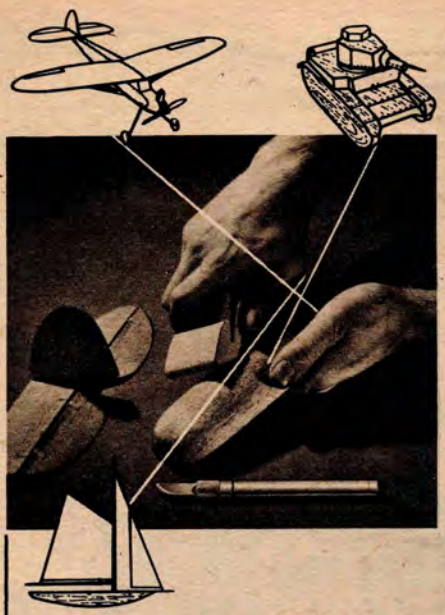
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The Woman's Angle

Air Trails' special section devoted to the "air trails" (or is that "air fillies"?)

■ It's our guess that the first woman to step into a "made-at-home-with-loving-hands" air. machine set some kind of record just for being the first to climb aboard! Here in the United States, it was a gal by the name of Harriet Quimby who got the first (for women) pilot's license in 1911, and shortly afterward became the first woman to fly the English Channel. (She was pretty lucky the ship made it, at that.)

"Firsts" are interesting and important in any new field. (And the gals are still making them, and firing the competitive spirit in other gals and guys.) While the boys were laughing at the ladies—in a friendly way, of course—they were not stopping them or hindering them noticeably in aviation in the United States. In fact, they were downright generous. They thought it was cute. So—not only did a "first woman" fly the English Channel, but that same year an American altitude record was set for women—1,500 feet! (The world record at the time was all of 5,000 feet.)

In those early days, probably all you needed to have an air show and a crowd was to announce that a *woman* was going to fly an airplane. Half the town went home and hid under the bed, and the other half came out to see the daredevil just for gasps.

World War I brought a temporary impetus to aviation, which afterwards faded away. Flying was kept alive by little groups of barnstormers who traveled around the country exhibiting good but hair-raising skill. Notable in this barnstorming era was Katherine Stinson, who with her brothers finally settled down in Texas with a fixed-base operation. They ran a good flight-instruction school, trained many pilots, including a great number of men for the RAF.

One must remember that flying was a sky-high expensive pursuit in those days, and airports and instruction ships were not exactly abundant or close at hand. So it was not until the late Twenties that women were inspired to take up aviation as a serious business. First trans-Atlantic feminine flight honors went to Amelia Earhart; then came her solo passage in May 1932. She was also the first person (male or female) to make the solo flight trans-Pacific from Hawaii to California (1935).

Aero Clubs of countries all over the world had by this time consolidated to form the Federation Aeronautique Internationale (of which the National Aeronautic Association is the United States affiliate), headquarters in Paris. Aviation was getting organized, getting standards, and laying bases for measuring its progress and advancement—and it started keeping records.

In 1931, the Bendix Trophy was created, timed to coincide with the first of the historic National Air Races. This coveted trophy was presented originally for the fastest nonstop time from Los Angeles to Cleveland, the traditional home of the National Air Races. This race was open to *both* men and women.

Ships were flying farther and faster. Whether it was timidity or unavailability of racing ships, the women didn't get into the Bendix swim until four years later, 1935. Amelia Earhart was the first woman to fly the Bendix, and she took 5th place in her Lockheed Vega (Pratt & Whitney Wasp engine) in 13:47 hours at an average speed of 149.578 mph.

The next year, 1936, due to disqualifications and freak mishaps, the gals stole the show. Louise Thaden and Blanche Noyes went from New York to Los Angeles in their Beechcraft C-17R (Wright Whirlwind engine) and set a new east to west transcontinental record of 14:55 hours, average speed of 165.32 mph. Laura Ingalls took second place in her Lockheed Orion 9D (Pratt & Whitney Wasp). Amelia Earhart came in 5th in her Lockheed Electra (Pratt & Whitney Wasp). Note that these were all commercial-type aircraft, in-production models, and not specially built racing planes.

The novelty of having women compete in this transcontinental race was no small factor in bringing out the crowds—and the publicity value was tremendous. Large amounts of extra prize money were offered to the first woman to cross the finish line.

In 1937, a comparative newcomer, Jacqueline Cochran, was the only woman entry. She came in 3rd with her Beech D-17W (Pratt & Whitney Wasp Jr.) in 10:29 hours with an average speed of 194.74 mph.

Competition was becoming keen. A note of safety had to be injected into this high-speed race. The following year, 1938, saw a change in the regulations governing the entrants. Each ship in the Bendix had to be equipped with blind-flying and radio equipment. Each pilot had to have an instrument ticket. This race was won this time by Jacqueline Cochran, the only female entrant, in a Seversky (P&W Twin Wasp). She flew from California to Cleveland in 8:10.3 hours, averaging a speed of 249.77 mph, and then went on to Bendix, New York, for extra purse given for finishing first.

More of women's records later.

—NONIE HORTON

Caro Bayley (shown above) is another rising star on the feminine aviation horizon. In the last two years she has distinguished herself by establishing one unofficial altitude record of 24,504 feet and one official of 30,380 feet. In addition, with her 125 hp Pitts she won third place in this year's National Aerobatic Championship in Miami, Fla. During World War II, Caro flew with the WASPS, handling a variety of airplanes from heavy Thunderbolts to multi-engine bombers. Her home is Springfield, Ohio.

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Jim Walker FIREBABY

Buy it ready to fly, complete with flying lines, "slow motion" prop and full instructions for flying and stunting. Wing span is 19 inches, weight with motor, 3 oz. All parts are finished, painted, fuel-proofed. Just slip them together, bolt on wing and motor, "gas up" and you're ready to take off!

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TRAIN IN MIAMI -- AIR CAPITAL OF THE WORLD

AIR TRAILS
APRIL, 1951



Air Mobilization has come!

By **LOUIS E. LEVERONE**, President, National Aeronautic Association

These are months of mobilization. The armed services must be built to 3½ million before July. More than a million must be in the air forces.

Many hundreds of thousands will be needed in civilian jobs. The aircraft industries will take a million more for the goal of 50,000 planes a year. Double that, as in the last war, is likely before the peak is reached.

How fast this manning is done and how ably the job completed will depend largely on America's greatest secret weapon such as no other nation has . . . on the knowledge and skill in the heads and hands of young Americans.

It will take the work of millions, to the limit of human endurance, to save the peace or win a war. We oldsters will do our part. The veterans of the last war will do theirs. But the energy of youth will swing the balance.

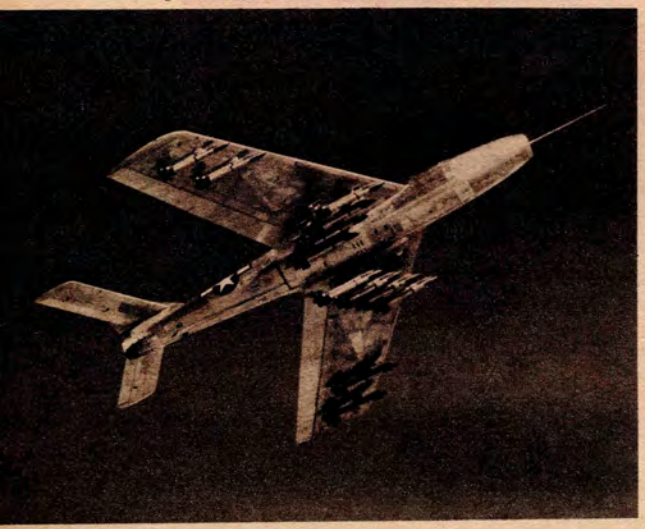
You have read history recently enough to know how liberty had to be won again and again, through the centuries, and how narrowly we have missed losing. You need only read the papers to know that if we are weak today, your way of life will vanish and you may grow old without regaining it.

Air Power will decide. The duties are exacting. They are best done by those who feel they belong in aviation. If that feeling is yours, let it lead you to examine the opportunities . . . civilian and military . . . and advance into that which you choose.



It took intensive screening and training to turn the two men in the cockpit of this twin-engine aircraft into competent pilot officers.

Typical of the new planes coming is the triple-threat ground-support fighter-bomber Republic F-84F.



Our Expanding AIR FORCE

It's an organization more highly skilled than ever before . . . In flight or on ground all are specialists

By MAJOR GENERAL RICHARD E. NUGENT, USAF
Deputy Chief of Staff, Personnel

■ Against the threat of Red aggression, the U. S. Air Force is doubling its strength. The goal for June 30, 1951, is nearly a million officers and Airmen in service compared to a total of barely half that before the Korean War.

In number of units, the Air Force is building from 48 Groups before Korea to 68 or more by June 30 and at least 84 as rapidly thereafter as possible. Secretary Finletter has indicated that 95 groups will be built. In World War II, we reached a peak of 243 groups.

The new units will be harder hitting than those in the last war. Bombers will be heavier and faster; they will fly farther with more load. The fighters will pack more fire power in rockets, bombs and guns. Jets which were just being developed during World War II, will be many.

All this calls for an Air Force more highly skilled than ever before. In today's Air Groups, in flight or on the ground, EVERYONE IS A SPECIALIST.

While part of the present manning is by call from Air Force Reserves and Air National Guard, many of these units are not at full strength and need recruits. Especially, there is a shortage in such urgently needed occupational skills as electronics, communications, and aircraft maintenance.

Air Power

The role of air power has been continually expanding through the years. There is no stopping point in sight. New inventions are announced in rapid succession. Yet more technical improvements keep coming as the Air Force and air industries work to keep always ahead.

Aerial warfare is the way to bring wars to a close with the least expenditure of lives. Allied air supremacy over Europe made it possible to win World War II with relatively fewer losses than in World War I, when the airplane was little more than a scouting and light bombing device.

In the Pacific, Japan's early push to gain islands proved to be of no avail. When we took the offensive, we bypassed the island strongholds and rendered them helpless by cutting supply lines.

When air supremacy was gained over the Japanese homeland, the will to resist was fast crumbling. When two A-bombs were dropped, a great well-trained and experienced army surrendered without firing a shot.

It cannot be said too often that the armies of the Communist nations cannot be matched in numbers. They can be surpassed by technical equipment and skill, in which America leads the world.

Air Commands

The U. S. Air Force was given separate status by the Unification Act of 1947, which created a single Department of Defense over three co-equal departments of Air Force, Army, and Navy. Under its own Secretary and Chief of Staff, who is a member of the Joint Chiefs, the Air Force not only administers its own flying units but related services such as supply, medical, and communications.

The Strategic Air Command operates the long-range heavy bombers, such as the intercontinental B-36's. Flying so high that they can't be heard from the ground and, large though they are, can't be seen even in clear daylight, these sky giants are capable of flying over enemy heartland independent of foreign bases. The heavies are on constant alert, to fly if the call comes.

Continental Air Command has a primary mission of training the civilian components, through 4 numbered air forces.

The Tactical Air Command (*Cont. on page* 66)

MOST NEEDED SKILLS

Following are the occupational fields in which the Air Force most needs personnel in its current expansion:

FOR AIRMEN: Radio and Radar Maintenance; Communications; Aircraft and Engine Maintenance; Armament; Weather; Supply; Food Service; Languages.

FOR OFFICERS: Electronics; Communications; Armament; Finance and Auditing; Specialized Observer (Radar, Navigator, Bombardier); Engineering (civil, mechanical, chemical, electrical); Food Service; Personnel; Business Management; Procurement; Transportation; Intelligence and Cryptology; Air Police; Weather; Mathematics; Physics; Languages; Photo Interpreter.

Complexity of large aircraft like the B-36 demand highly specialized qualifications from crew complement; this Sgt. is radio op.



MILITARY PILOT TRAINING

AIR FORCE

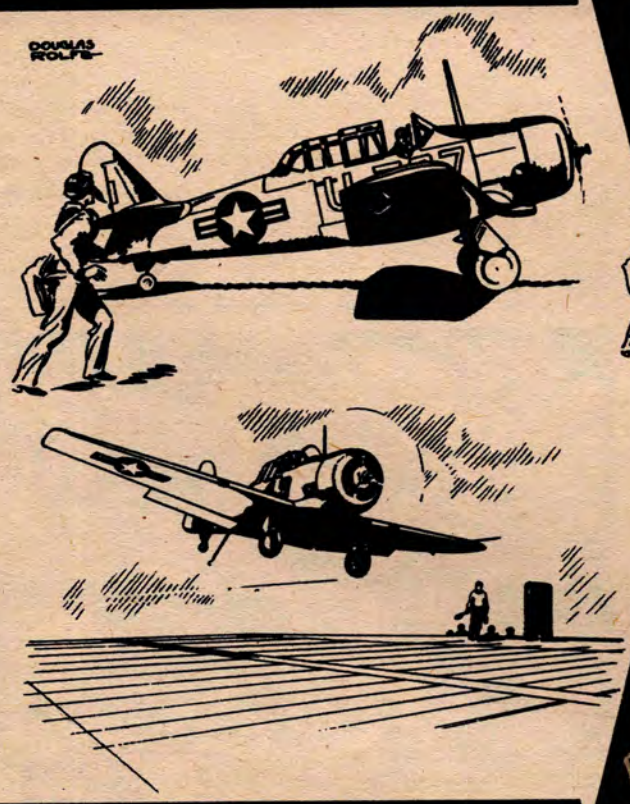


BASIC. T-6, 130 HRS.



ADVANCED 1-ENGINE. T-38, 70 HRS.; FT-51, 65 HRS.

NAVY and MARINES



BASIC. SNJ, 173 HRS., INCLUDING CARRIER QUALIFICATION



ADVANCED CARRIER TRAINING. F4U, F8F OR AD, 108 HRS.



ADVANCED PATROL PLANES. PBM, PB4Y OR P2V, 137 HRS.

It's a long cry from the last war-time training of an aviation cadet to present-day methods. No longer does the student have to go through the primary, basic and advanced stages in strictly training type ships such as the PT-17, BT-13 and AT-6. (Navy SN2S, SNV and SNJ). Nowadays, as soon as he is selected for flight training, he enters the basic stage and green as he may be, is given instruction in the North American T-6 (SNJ) which, only a short time ago, was considered an advanced type. The Air Force gives 25 hours of dual time in the plane and the remainder of the basic course, 105 hours, includes maneuvers, night flying, navigation, instrument flying and aerobatics. Added to that is 154 hours of ground training. Basic course takes 28 weeks. Graduating from the basic course, the cadet has a choice to qualify for the single-engine conventional, single engine, jet or multi-engine advanced course



ADVANCED JET. T-28, 70 HRS. T-33 & F-80, 65 HRS.



MULTI-ENGINE. T-28, 70 HRS. TB-25, 65 HRS.



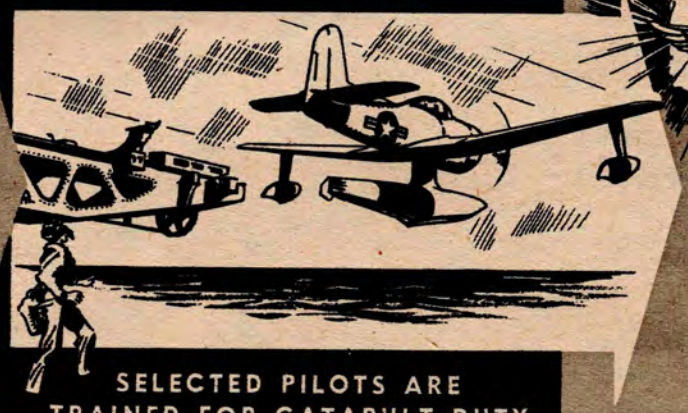
ADVANCED CARRIER QUALIFICATION. 12 HRS.



ADVANCED JET. TO-1, 25 HRS.



STUDENTS QUALIFY AS PILOTS AND CO-PILOTS



SELECTED PILOTS ARE TRAINED FOR CATAPULT DUTY

where he gets 135 hours of flight training in types of aircraft illustrated here, plus 180 hours of ground school. After 24 weeks in the advanced stage he is eligible for his pilot wings. He also receives in each course 107 hours of academic training in aircraft and flight operations, gunnery, weather and communications, and 215 hours of officer training.

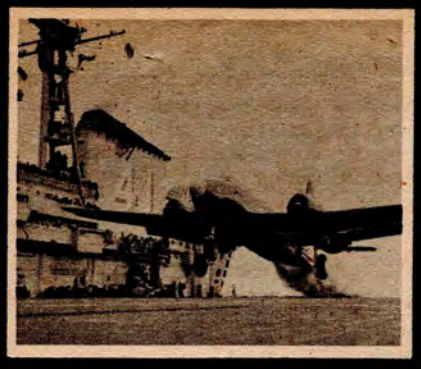
If he chooses the Navy, he will get 22 hours of dual and 151 hours of solo in an SNJ in a basic course. Including basic training, it takes 293 hours and 72 weeks to graduate as single engine conventional plane pilot, 328 hours and 76 weeks to become a jet jockey, and 310 hours and 43 weeks for the multi-engine course. In addition, naval cadets qualifying for single-engine rating are required to take 1454 hours of ground training, and those in multi-engine course, 1391 hours.

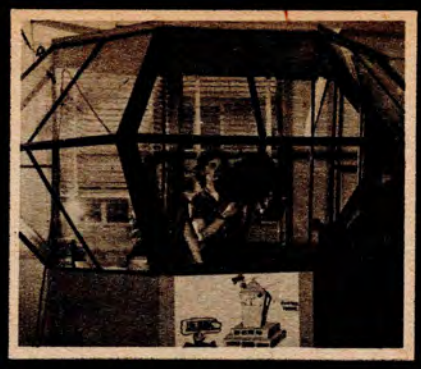
YOUR PLACE IN
AMERICA'S ALL-OUT
AIR EFFORT













the AIR NAVY

This floating air force is a technician's paradise for thousands of the highly-skilled

By VICE ADMIRAL JOHN H. CASSADY
Deputy Chief of Naval Operations, Air

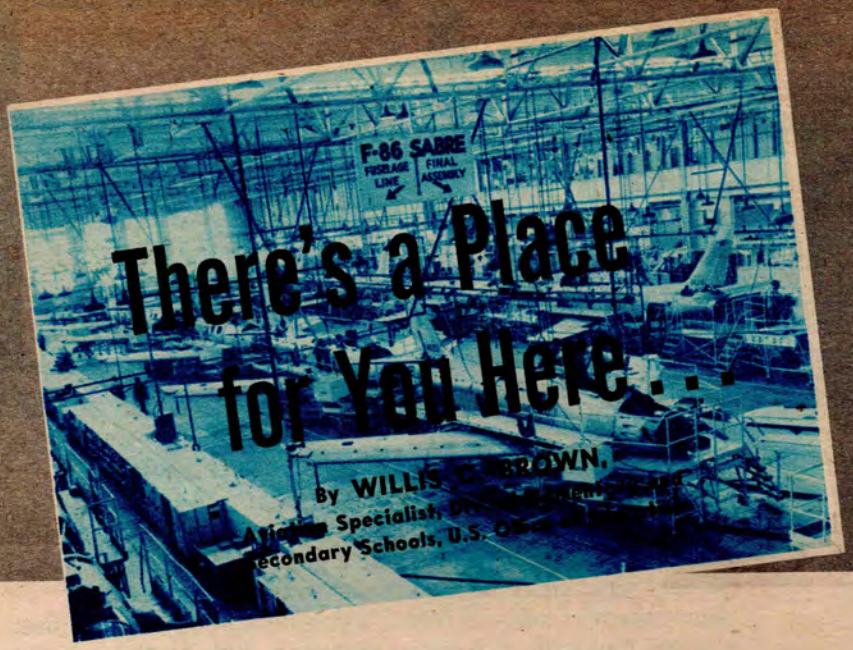
■ Before the airplane, the Navy's striking power was limited to the few miles' range of a ship's guns and its field of vision was only what could be seen from the top of the mast.

Since the first take-off from a ship's deck, the range has been extended hundreds of miles as planes fly with bomb loads and return. Year by year, heavier and faster planes with a larger operating radius are ship-based as carriers and their techniques improve.

The field of vision has widened to include all within the radius of aircraft reporting by radio. Everything on the ocean's surface is known, whether by day, night, or fog, as airborne radar scans in all directions. Beneath the surface airborne devices are probing farther and farther for lurking subs.

Control of the sea is essential to the winning of a war. Rich as our nation is in raw materials, our industries would be badly handicapped without continuing shipments of certain key metals, such as tin and manganese, and products of the tropical forest and plantation which can't be grown at home.

Military operations at great distances from our shores are dependent on ocean-borne supply. An airplane (*Continued on page* 61)



There's a Place for You Here . . .

By WILLIS [illegible] BROWN,
Aviation Specialist, [illegible]
Secondary Schools, U.S. [illegible]

Following are the main classes of aviation jobs that are common to military and civil aviation. There are dozens or even hundreds of subclassifications under each heading.

Omitted here are the strictly military jobs with no counterpart in civilian life, such as gunner or bombardier. Omitted also are the many civilian specialties (cooks, stenographers, etc.) obviously needed.

That leaves the type of aviation work in which your service, whether in uniform or as a civilian, may give you a career in peacetime aviation.

FLIGHT

It is an advantage to come into aviation through flying. Although less than 10% of the jobs in an air force or airline are aloft, many of the best ground positions are held by former pilots. However, there is much responsible work in aviation for non-flyers, as you may read below.

FLIGHT CONTROL

These jobs, in air forces, airlines, or CAA require high technical skill, alertness, and character. Here, as in the sky, you must be right in split-second decisions, and that takes years of study and experience, as well as special aptitude. You can be proud to win placement here.

AIR TRANSPORT, MAINTENANCE, AND OPERATIONS

More numerous are the airport employees who keep planes flying and see that every complex duty on the field gets done . . . right and on time. All this work, like the flying and control jobs, requires alertness and know-how. In aviation, you work with good people. They have to be.

AIRFRAME CONSTRUCTION

Much of this work is comparable to that in any metal products factory but requires higher precision than most. The broader the worker's knowledge of aviation, the better the understanding of the job . . . and the better the chance of becoming a part of aviation's permanent labor force. If you have any of the skills marked on the opposite page, there may be work for you in an airplane parts or assembly plant.

HOW TO FIND YOUR PLACE

Think it over and take nothing for granted until you have examined all the facts. First, read all the career reports in this issue. Then get more information about the opportunities that appeal most to you. The concluding report "For Young People" tells you how to seek guidance both about the jobs and about your own aptitude.

These Training Courses or Skills will help you fill these jobs

X=NEEDED SKILLS; O=RELATED SUBJECTS

	SHOP WORK: MACHINE, SHEET METAL, WOOD, ETC.	INTERNAL COMBUSTION ENGINES	ELECTRICAL THEORY AND SHOP	MECHANICAL DRAWING	SCIENCE: PHYSICS, CHEMISTRY, ETC.	MATHEMATICS	FLIGHT AND PREFLIGHT
Pilot and Copilot		X			X	X	X
Navigator				O		X	O
Flight Engineer	O	X	X	O	O	O	
Other Flight Personnel	O	O	O				
Instructor		O	O			O	X
Traffic Controller	(Should be pilot)				X	X	X
Airways Communicator			O				O
Aircraft Inspector	O	X	X	O			O
Meteorologist					X	X	O
Radio Operator	O		X	O	O		
Airport Management	(Should be pilot)				X	X	X
A&E Mechanic	X	X	X	O			
Electronics Specialist			X	O	O	O	
Propeller Specialist	O	O		O			
Reservations Clerk						X	
Flight Dispatcher	(Should be pilot)				X	X	X
Machine Operator	X	O	O	X			
Sheet Metal Worker	X			X			
Riveter	X			O			
Welder	X			X			
Electrician	X	O	X	O			
Plastic Worker	X			X			
Draftsman				X			
Inspector	X	O	O	X	O	O	

OTHER USEFUL PREPARATION MAY INCLUDE:

Physical training; English speech and composition; modern languages; geography, slide rule; business courses.

For all aviation work, flight or ground, lightplane flying and preflight courses (navigation, weather, flight theory, etc.) are background which should be acquired if possible. Model airplane flying, both for young people and adults, gives valuable experience short of flying itself.

ARMY AVIATION

The fighting man on ground now has an airborne buddy to spot his fire, tote his rations and ammo

■ Since the winning Army Air Force of the last war was split from the Army by the Unification Act of 1947 and made independent, the Army has become more air-minded than ever.

While the Army does not operate its own fighters, bombers, and big transports, every soldier in the field—from Private to General—is keenly aware of what air cover means to the troops, vulnerable if the enemy controls the air. We soon would have been driven from Korea had not our air units swept the Reds from the sky.

Techniques of airborne warfare have been fast advancing between the wars . . . how to seize "airheads" by paratroops; build up battle lines by units landed in assault planes or helicopters; drop supplies up to and including cannon from the air; fly light tanks to the lengthening front; and seize the best positions until bigger units arrive.

In addition to the paratroopers and others classed as "airborne," and always expected to fly, almost anything and anybody may be "air transportable" by military necessity. In Korea, even metal bridge trusses to take the troops across rivers were flown to the front with a saving of time that meant advancing at far less cost of life than if the enemy had had a little longer to strike back.

Largely abandoning the idea of gliders, tried in the last war, the Army, like the Marines, is putting more and more faith in helicopters and looks ahead to more assault planes capable of landing on hastily improvised strips at the front.



That "U. S. Army" L-19A is something new in the sky. Made by Cessna; for close work with ground troops; engine is 213 hp.



Light as a feather—this Bell helicopter has been assigned to 3rd Army Hq.; ground forces have great appreciation for versatile 'copter.

Army's Planes

All these planes are designed and the flying done by the Air Force on behalf of the Army Field Forces whose Generals have been ardently boosting more and better airlift and air support.

But the Army also has some aircraft of its own. As the Air Force operates boats from its bases near the water, and the Navy has trucks on land, so the Army needs planes for many purposes just as it uses jeeps.

Artillery spotting was among the few uses permitted for lightplanes in combat areas during the last war. Daring flyers in khaki-colored "puddle-jumpers," similar to the two-place training or sports planes you may see at your nearest civilian airfield, watched bursting shells and radioed firing directions to the gunners. When the enemy was blasted in one place, they went to look for more targets.

Now, every Army Division has lightplanes assigned, with specially trained officers to fly them and non-commissioned mechanics for field maintenance.

Until recently, the flight training of such pilots was done by the Air Force whose regulations prescribed the Air Force wings with the letter "L" inscribed as the badge of the Liaison Pilot.

Now the L-pilot rating has been superseded by that of Army Aviator to be awarded by the Army rather than by the Air Force. The Senior Aviator badge, bearing a star, is for 1,500 hours or 7 years of flying service.

Civilian pilot training now is credited in awarding the Army wings, awarded only to Army officers after a special course of training for combat at the Artillery School at Fort Sill, Okla. The Army expects soon to take over its own pilot and mechanic training program.

Young men who desire (*Continued on page* 59)

The Air Reserves



Many military aviation careers get a head start with the Air Reserve or Air National Guard

By COL. A. B. McMULLEN
Executive Director Air Reserve Assoc.

■ For young men and women eligible for military service, there are marked advantages in joining one of the Air Reserve components. That is the way to identify yourself with the branch of service you prefer, and get a running start—prepare for duty while still a civilian.

Here are some of the main points:

Choice of Air Service. If you wish to be in aviation, Air Reserve affiliation will put you there if you are called as a Reservist. If you are drafted (as those who joined the Reserve since 1948 may be) there is a better chance of air assignment after background in aviation than without it. In the last war, 17-year-olds who joined the Air Reserve were automatically inducted into the Air Force at 18 on completing studies. Similar plans may be expected as the new situation develops.

A Chance to Prepare. By home study and by attendance at meetings, drills, and maneuvers, a Reservist may learn military and other special skills. This is a great advantage in adjusting to military life and finding the way to advancement.

Promotions. Reservists may advance to non-commissioned and commissioned grades. If called, they will enter active duty at Reserve rank.

In general, enlistment in the Reserves is on much the same qualifications as into the Regular armed forces. Enlistment age runs from 17 or 18 to the early 30's. Older people with special skills may be admitted.

Initial grade may be based upon the experience of the applicant. Regulations permit those of exceptional experience to become officers at the outset.

The pattern is similar for the U. S. Air Force, and for Naval and Marine aviation. Army Aviators do not have Reserve units of their own but are specialists in typical Army Divisions. They may practice at civil airfields in standard commercial light planes.

Organized Units

In peacetime, the Air Reserves maintain organized units—Wings, Groups, Squadrons, and Flights—with their own officers, non-coms, planes, and equipment. Each unit conducts its own program of part-time training and practice so it is ready to go on full-time duty under its own commanders.

Air Reserve units called in the Korean War quickly mobilized, flew their planes overseas without loss or accident, and are giving a good account of themselves. Led by veteran air officers from the last war, the Air Reserves perform on the same standards as the Regulars.

As this is written, many of the organized Air Reserve units have been called. Your opportunity to serve in such a unit, at any time, depends on whether there is one close enough to your home.

In addition to the Reserves, there is a National Guard in each State. The ground units are affiliated with the Army and the Air National Guard with the U. S. Air Force, to become a part of it if called to federal duty. There is no corresponding organization for the Navy or Marines. Guardsmen may rise from the ranks to officer or flying cadet appointment.

Many of the Guard Regiments and Squadrons have been called. Anyhow, the opportunity of serving, as with Reserve units, (*Continued on page* 70)



FOR YOUNG PEOPLE
... and some older ones too

Straight talk about an important subject: air careers for thousands of alert, interested young Americans

■ If you are going to choose aviation, now is the time to decide. The way things are going, young men approaching their upper 'teens may expect—if they are physically and mentally fit—to spend at least two years in one of the armed services, whether or not there is a universal training law.

Of the 800,000 youths who become 18 each year, no more than 570,000 are capable of serving. Of these, some will be deferred for educational or other reasons.

It is easy to see that the eligible remainder will be not much more than enough to maintain a force of 3½ million or more, as now planned. A huge annual induction of boys newly 18 will be required to replace those who serve their time and are discharged. Full war, if it comes, will call for still larger numbers.

For women, the departure of so many males leaves both an opportunity and a duty to serve in war jobs, as told on the opposite page. Draft of women is not expected unless or until the manpower barrel is scraped to the bottom. But in total war, one never knows.

All young people owe it to themselves to give most careful study and thought to their career plans in the light of the new state of world affairs.

Is Air Your Choice?

The main purpose of the foregoing series of reports is not so much to sell air service above the other necessary defense forces as to help those already bent in that direction find what branch of aviation is best for them.

If you think air is your choice, then here are some steps to help you make sure and to start getting ready:

• *Stay in school.* Aviation is so exacting that you can't have too much know-how. The lure of easy jobs in a war boom may be hard to resist. But keep to your books as long as you are out of the service. Training and the habits of study will help you make good in any air force and will give you a better chance in civilan life afterwards. (See the job chart on pages 26 and 27 for the type of courses needed.)

• *Make aviation your hobby.* Airplane model building and model flying will teach you much about the principles of flight. Air modelers learn to use both their hands and their heads. Spare time that otherwise might be wasted may be used for your future, just as enjoyably as in hobbies that get you nowhere.

• *Join a volunteer group.* Air modeling, of course, is best done in a model club to share the experience of other enthusiasts and pit your skill against theirs. Beyond this, 'teen-agers can join one of the recognized air youth groups such as the Air Explorers of the Boy Scouts, the Wing Scout program of the Girl Scouts, or the Civil Air Patrol Cadets for both boys and girls. Civil Defense air units and spotter service will be open to those mature enough to take the responsibility.

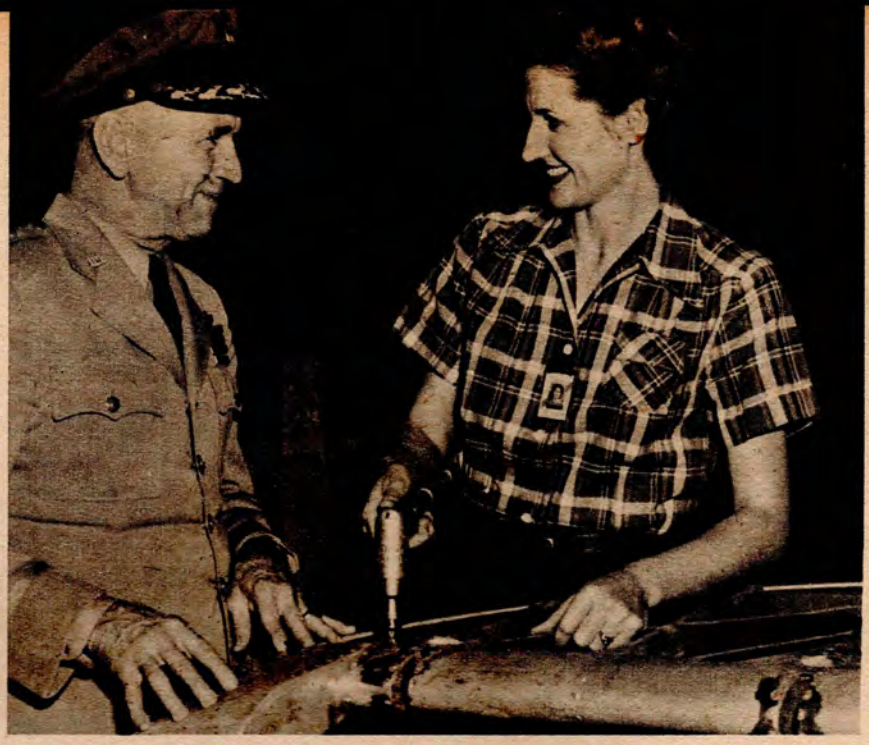
• *Consider Reserve affiliation.* As laws and regulations governing draft and induction are subject to many changes, young people approaching 17 or 18 must keep up to date if they wish to make their own choices rather than wait and have no choice. Will a Reserve status help you train and assure your placement in the service you desire? Today's answer may not hold good tomorrow. Keep up to date!

• *Form a career club.* If a few young men in a school will share the task of getting latest dope from the services, not less than once a month, reports can be shared with the whole class. Such teamwork will make it easier both for you and for the recruiting services.

(*Continued on page* 69)

Women's Work

The ladies are needed in the services and needed along the production lines in industry



Back in '41 Mrs. Gertrude Threadgill, a San Antonio, Texas housewife, left her kitchen, and held down a production line job at Kelly AFB until '45. In answer to latest call for women workers she's being welcomed back on job by Maj. Gen. Clements McMullen.

By COL. GERALDINE MAY

■ Total preparedness can't be accomplished by the male half of the people alone. There's a bigger job for the female half than in any previous crisis.

No less than 40% of the aircraft production workers during the last war were women. The ratio may be even higher at the next peak of activity.

Visit an aircraft assembly line and you will see girls in coveralls busy at every stage as the planes roll toward the doors to the flight line.

Closer to the Air Force, hundreds of thousands of Civil Service workers and civilian employees, of course, will be needed for the office work at headquarters and bases. Closer still are those in uniform.

Women in Uniform

In World War I, aside from nurses, there were no women actually on military status except the Navy's few yeomanettes. In World War II, all the services—Army, Navy, Marines, and Coast Guard—began to open their doors to women.

It may have been with hesitation that Generals, Admirals, and Congressmen approved the recognition of the uniformed service, disability pay and retirement, as well as the incentive of rank for women. But the faithful, efficient record of the servicewomen have earned these rights for them.

Much of this advance was pioneered by air units. From the beginning of the last war, Civil Air Patrol, later to become an auxiliary of the Air Force, gave equal opportunity to men and women. Some women flew on anti-submarine coastal patrol.

In 1942 Congress authorized establishment of the Women's Army Auxiliary Corps, which was later changed to the Women's Army Corps. This organization trained women for duty with the Army and the Army Air Forces. In 1948 legislation was passed authorizing integration of women in the Army, Navy, Marine Corps and the newly established U. S. Air Force.

At present, the Air Force is utilizing women in the majority of its career fields. In addition to performing administrative duties, they receive technical training as control tower operators, weather observers, radio operators, radio mechanics, photographers, radar mechanics, parachute riggers, clerk-typists, stenographers, medical assistants, dental assistants, cooks and many other jobs essential to the Air Force.

In the first years of the war, the WASPs—Women's Auxiliary Service Pilots—were trained by the Air Force but employed as civilians to fly transport planes and even fast fighters. They ferried new planes for delivery from factories to bases. The director of the WASPs was Miss Jacqueline Cochran, famous aviatrix and business woman, who at the present time is serving as chairman of a board of special consultants to the Air Force Chief of Staff on programs pertaining to all female personnel in the Air Force.

Women's work in the last war is likely to seem a small experiment indeed compared with the effort ahead. Complete manpower use is needed—in the services, factories, farms, mines, transportation system, and every useful industry. For the first time, labor will be short even after employing every able man. The answer is women and more women.

Five-Fold Expansion

The strength of the WAF—Women in the Air Force—has been limited to 2% of the total peacetime Air Force strength of officers and (*Continued on page* 71)

The Author, Col. May, is Director, Women in the Air Force (WAF) and the first to hold that position. A former personnel head, she was commissioned from first officer candidate class of the WAAC in WW II.

Civil Defense: Spotters and Flyers

The need for civilians in America's air mobilization is great; you can do your part—read how

By KENDALL K. HOYT

■ Since the threat of attack is largely from the air, it follows that aviation-trained people have a major role in countering the enemy in civil defense as well as in our air forces.

Americans, young and old, who know planes can be effective volunteers, especially in the air spotter system and in the civil flying corps.

Aircraft Spotters. Although there will be much more detection equipment at work—more radar screens—than in the last war, many volunteer watchers again will be needed in emergency.

Civil Air Units. For disaster relief, anti-sabotage, and other vital duties, the nation's private aircraft fleet will be a "lightplane air force" in which skills not only can be used but developed.

Organization is in the hands of the State Governors, subject to guidance by the Civil Defense Administration in Washington. Each state has a Director of Civil Defense. Under him there will be a director in each county or other local area.

For information, check with your local civil defense authorities when they are appointed. They won't be hard to find. They'll be looking for volunteers—looking for you.

Millions of volunteers must be organized and trained, if each area is to have enough defense workers to cope with a major disaster. The word on what to do if trouble comes must be carried to every citizen, including all the school children.

The magnitude of the training task may be realized from the estimate that at least 20 million should be competent to render first aid. That, incidentally, is something all aviation people in the program should learn.

Air Units

The place for airmen and airwomen was well demonstrated in the last war. Civil Air Patrol began as a division of the Office of Civilian Defense, always ready for the air attack that never came.

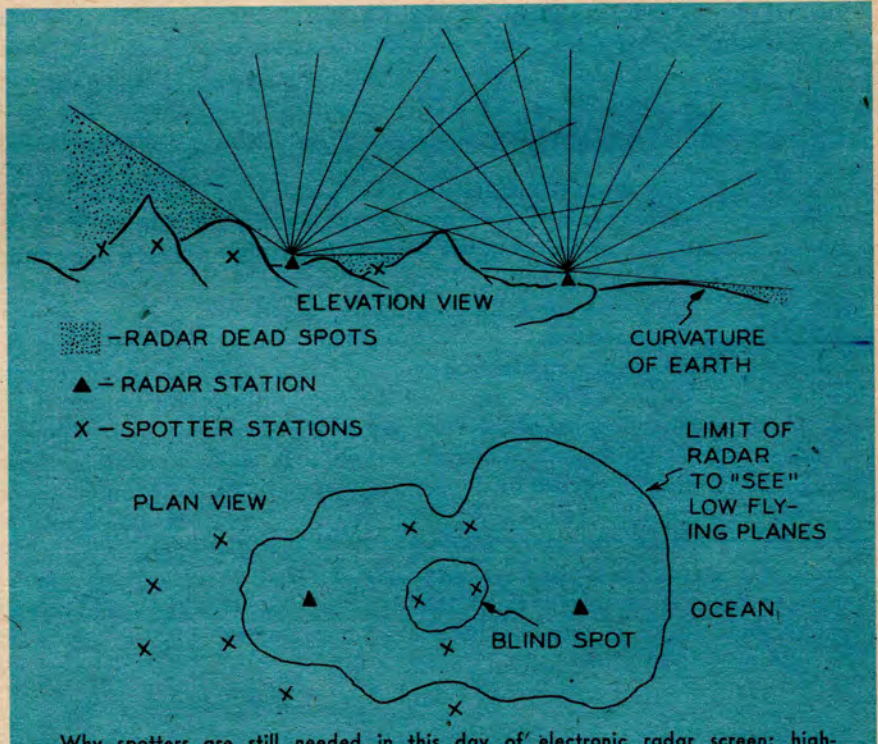
From an early stage, active flying, such as anti-submarine patrol with bombs on the little planes, brought CAP closer to the military than to OCD. So it became an auxiliary of the Air Force, a status later confirmed by law.

Today, CAP's military functions—for continuous patrol missions, for standby services such as missing aircraft search, and for preflight training of potential air recruits—still are assigned. CAP has been told to be ready to aid civil defense, both by flight missions and through its communications network.

The typical state, however, will include its own volunteer flying corps as part of civil defense transportation. It is felt that the civilian aid problems require a full set of services assigned to these duties and not subject to prior call for anything else.

This pattern was developed (*Continued on page* 77)

Col. Hoyt, the Washington correspondent of Air Trails, was one of the organizers of the Civil Air Patrol in 1941. As an Air Force officer he developed the CAP cadet program a year later. In present civil air mobilization plans he is active again as the delegate of the National Aeronautic Association on inter-association and official councils.



Why spotters are still needed in this day of electronic radar screen: high-frequency radio waves follow line of sight pattern, not curvature of earth. Result is many blind spots requiring observers to guard against low-level sneak attack



Civilian Employment

An expanding industry will be needing more than 1,000,000 within short time as the building program accelerates

■ In the many civilian tasks on the production lines and in civil aviation—always defense auxiliaries—more people will be employed than in the air forces.

The aircraft manufacturing plants are expanding from a total of 235,000 workers before the Korean War to an estimated 360,000 by June 30, and half a million not long thereafter.

This industry employed more than 2 million in 1944, its top wartime year, when nearly 100,000 planes were produced. The present build-up is toward an output of 50,000 craft per year. Modern planes, of course, are heavier and more intricate than those of World War II.

Hence, aircraft employment of more than 1 million is to be expected. The 5-year program of the air policy boards called for readiness not later than the start of 1953 when the enemy might have enough A-bombs to attack the United States. After 3 years of indecision, the program is being rushed in the 2 remaining.

(The type of jobs and the skills required are suggested in the job chart on preceding pages. This may serve as a valuable guide to those interested.)

Since most airframe and engine work requires a higher precision than for most industries, the patience and craftsmanship learned in aeromodeling is invaluable. Many aircraft shop workers, draftsmen, designers, engineers, and inspectors came into aviation through model building.

Opportunities are not limited to major airframe centers. For every big airplane the total assembly requires hundreds of subcontractors for parts and accessories.

One Company Speaks

"Based upon a 1700 percent expansion in World War II, we have geared our organization at North American Aviation to multiply, as rapidly as possible, our production of the airplanes and missiles required by the armed services for the defense of our country. The aircraft industry can expand as fast as the pipelines to our assembly lines are filled with the necessary materials, engines, radar and electronic gear and other accessories which we ourselves do not produce. These items represent a much larger percentage of the total job than in the previous expansion."

J. H. KINDELBERGER, *Chairman of the Board North American Aviation, Inc.*

Civil Service

Many openings will be offered also in governmental employment. All the armed forces, from the Pentagon to the regional commands and local bases, rely on hundreds of thousands of civilian employees for many types of work.

While the majority are in clerical work such as typing, filing, and record keeping, there are many technical and professional jobs. Most of the appointments during the emergency will be temporary. But once given a Civil Service rating, it may be possible to attain permanent status.

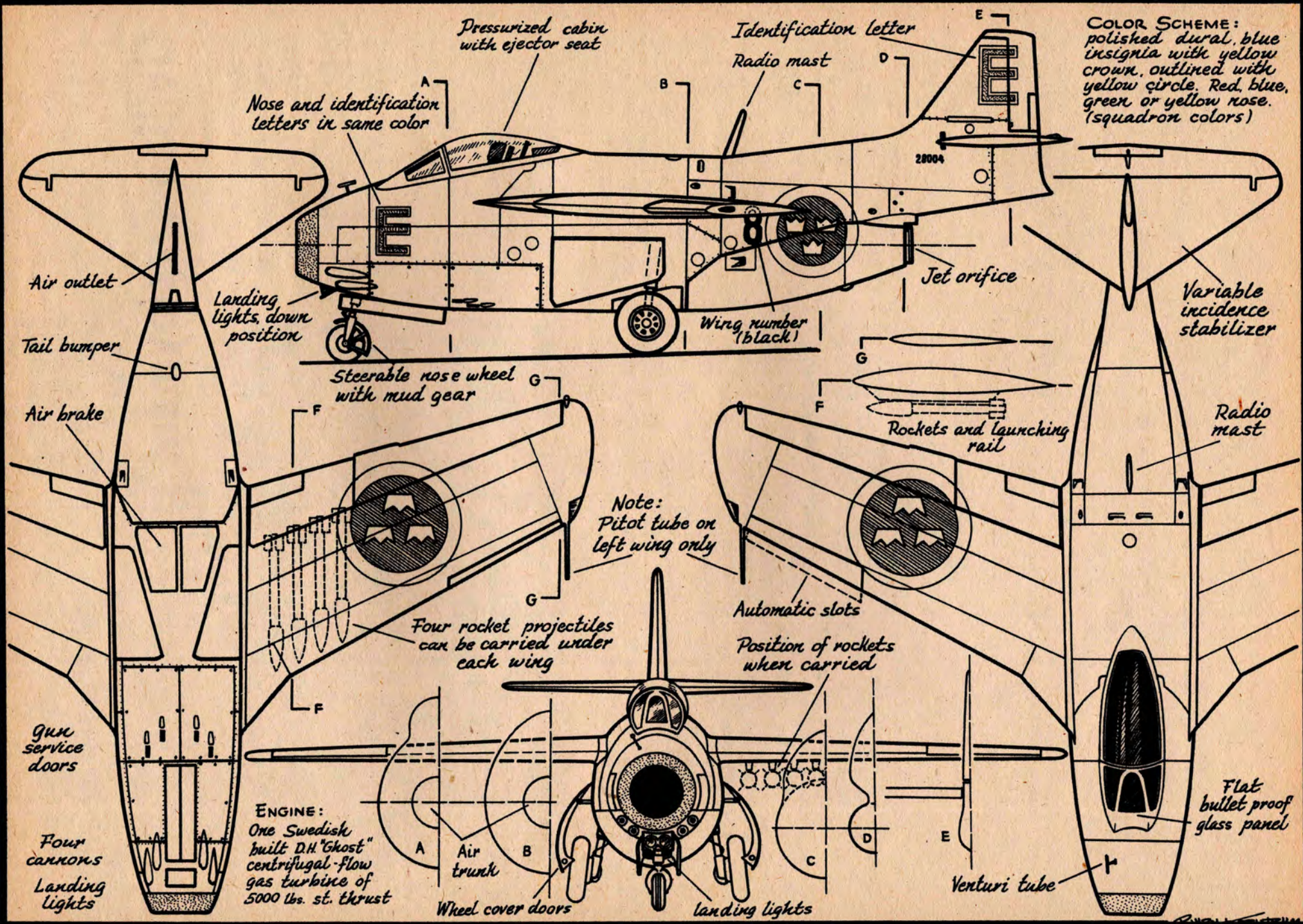
The peak of Civil Service employment in the last war was more than 3 million. The total has been running about 2 million in recent years but again is going up.

Your nearest Post Office will have circulars on current opportunities and examinations. Once on the register in a given classification, you may be offered an assignment after you wait your turn. Jobs are all over the country.

Veterans get preference. Those who have not used up their G.I. training entitlement have the further advantage of career courses in their chosen fields. Applications must be made by next July 25 as the law now reads.

Civil Aeronautics

Some of the best (*Continued on page* 69)



SAAB J-29 Swedish Jet Fighter (Scale 3/16" = 1' 0")

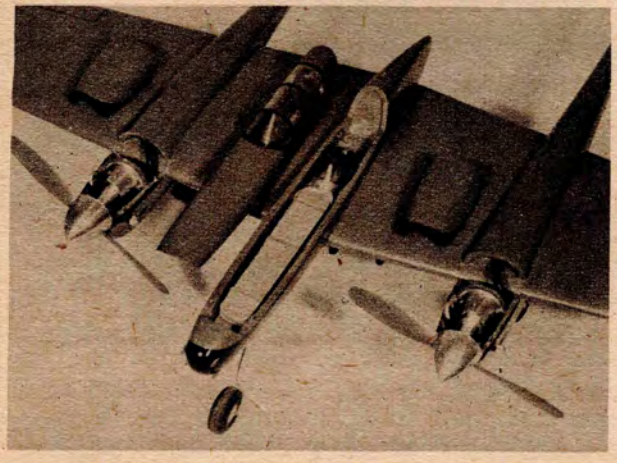
"AT" Interceptor



By WALT HUGHES

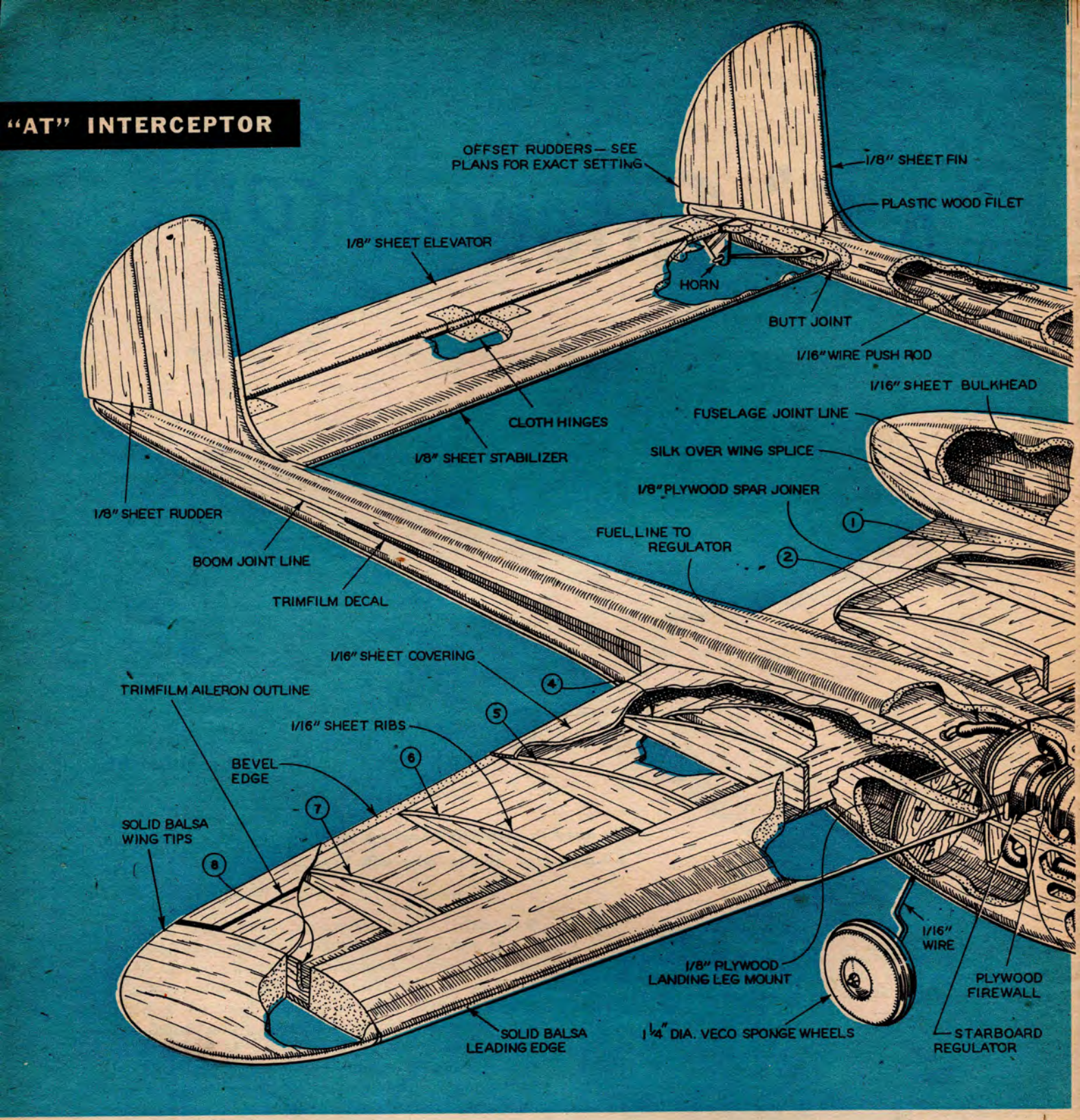
No need to give this beauty a build-up . . . she's strictly an All-American champ who will keep you running in circles

Neat installation. The Walker pressure tank gives fool-proof two-engine operation with minimum of headaches. Nice feature of system is both engines always quit operation at same time.



■ Designers of full-scale aircraft, limited by practical things such as the size of the pilot, location of engines, oil coolers, etc. cannot always make the outline of the airplane to their liking. The "AT" Interceptor, on the other hand, is a model plane designed primarily for artistic lines with no regard to practical limitations. Details borrowed from the P-38 and Black Widow Nightfighter are combined to the best advantage and a simple paint job accentuates the slim lines and carved fuselage. Rockets mounted below the wing and 40-mm cannons in the nose of the fuselage add realism.

Two engines operating from one fuel tank are a special feature presented here for the first time. This is made possible by using a Jim Walker pressure system to force fuel to the inboard engine, and fuel regulators keep the outboard engine from getting too much fuel. With this arrangement one engine can be started and allowed to run on the ground for several minutes before the other engine starts, but

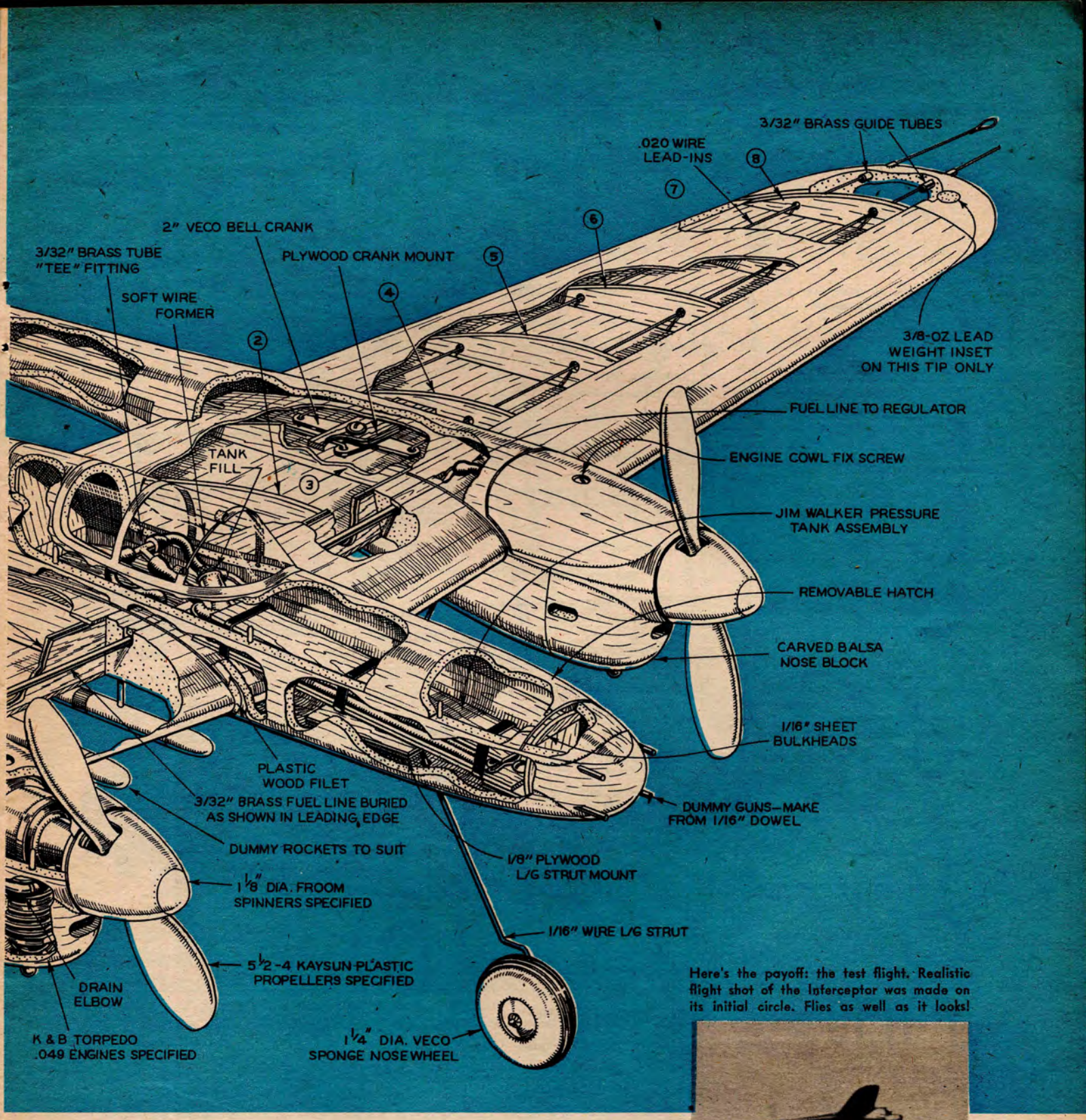


both engines will quit within a few seconds of the same time when the tank runs dry.

Conventional twin-engine models often run more than half a flight on one engine. Flight characteristics are surprisingly good for a semi-scale model. When balanced as shown, the "AT" Interceptor is steady enough to fly two feet above the ground and will fly reasonably well on only the outboard engine.

The pressure fuel system shown is very good for modelers who hope to do a lot of flying, and must be kept in good operating condition. Modelers who have not previously used one in a single engine ship can stick to the metal tank installation given in separate details, if desired. No hatch is required in the fuselage and less work is involved through the wing and engine installation for conventional type of metal tanks.

Start construction with the wing so that the fuselage and booms can be fitted as they are built. Cut out four 1/16" x 3" x 13½" sheets of balsa for top and bottom wing covering. Cut triangular pieces to fill out trailing edge to size shown and glue parts together. While these sheets are drying cut out the ribs and plywood spar joiner. Start the wing assembly by gluing bot-



Here's the payoff: the test flight. Realistic flight shot of the Interceptor was made on its initial circle. Flies as well as it looks!



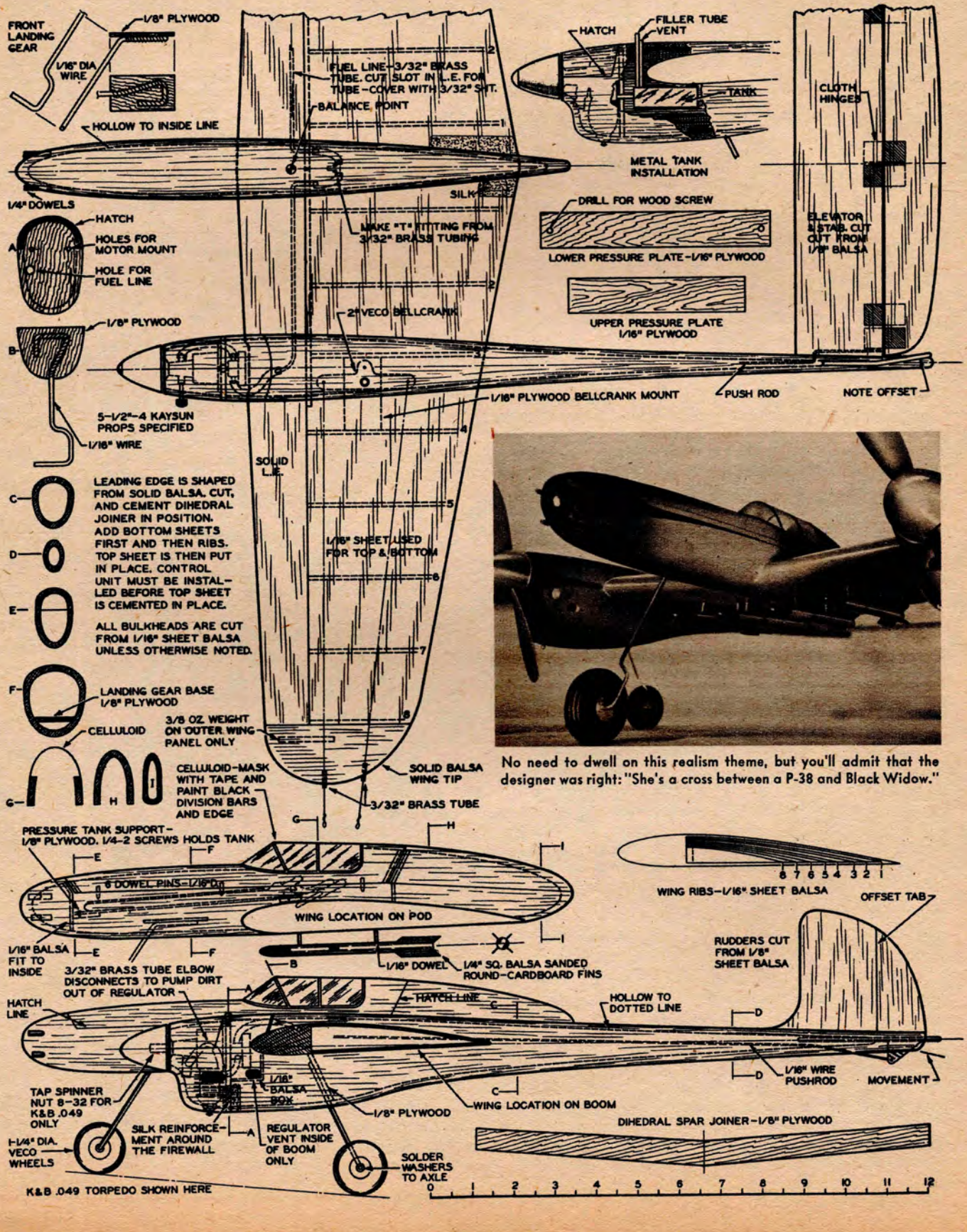
tom sheeting to the leading edge; work with left and right-hand panels separately.

Glue the ribs in position allowing ⅛" for the spar joiner on three inboard ribs. Install the controls in the left-hand wing panel complete with lead-in wires but no pushrod. Now fit the two wing panels, checking with spar joiner. Glue the spar joiner in one wing panel and bevel trailing edge. Glue top sheeting in place and shape leading edge with a small plane.

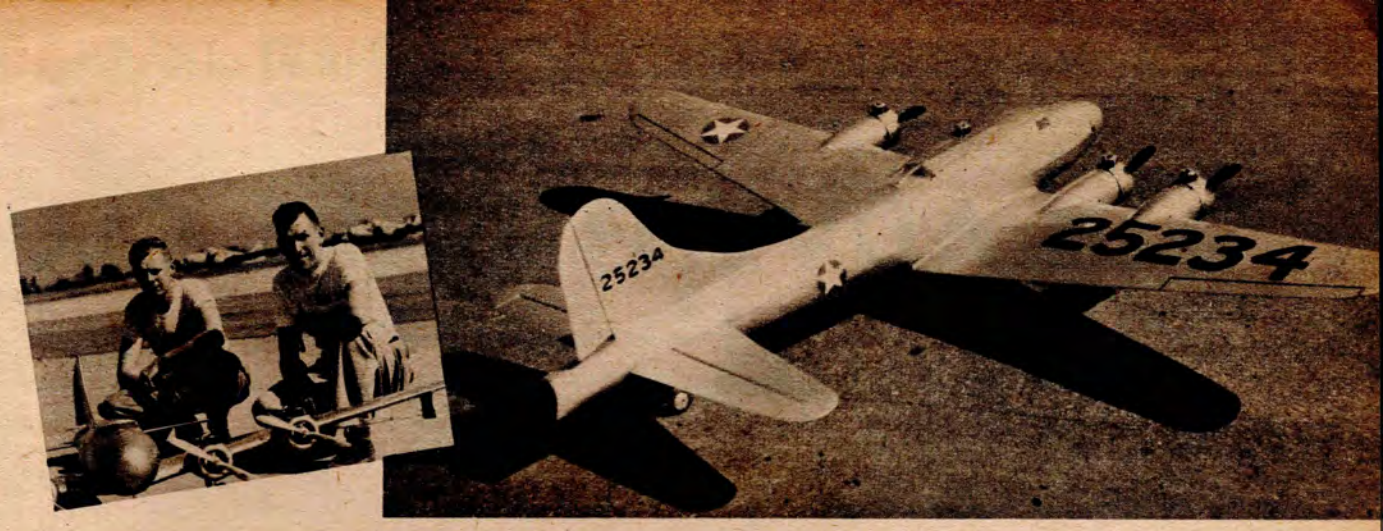
Shape leading edge of other panel, allowing for top sheet, and then join both panels using plenty of glue on the plywood spar joiner. When the assembly dries fit the remaining top sheet and glue in place. Reinforce center joint of sheeting and leading edge with a 1½" strip of silk, top and bottom. Add the (*Continued on page* 71)

"AT" INTERCEPTOR





No need to dwell on this realism theme, but you'll admit that the designer was right: "She's a cross between a P-38 and Black Widow."



One inch to foot B-17G with 103 in. span by G. M. Vansickle (L.), Dundas, Ont. Four O&R r.v. 60's; wt., 18 lbs; 69 ft. of electrical wiring. Flies fine; all silver; turrets to be added; real shocks. Handles nicely, even on 1 engine. Ignition engines can be cut together or separately.

Dope Can

News, Views, Comments and Photos from Model Clubs and Enthusiasts in America and Overseas; AT Pays $5 Per for all Photos Used

■ The big discussion is ended, the votes have been counted and the Academy of Model Aeronautics has come up with the big news of the year as far as the advanced contest flyer is concerned: very few changes in the A.M.A. competition rules!

Basically, the rules were refined slightly, some categories were streamlined; only one was dropped entirely, that for compressed gas motor models. So say good-by to CO_2 in the Nationals; we're certain it still will be flown in some local meets as well as the "CO_2 Nationals" held annually out in Shelby, Ohio.

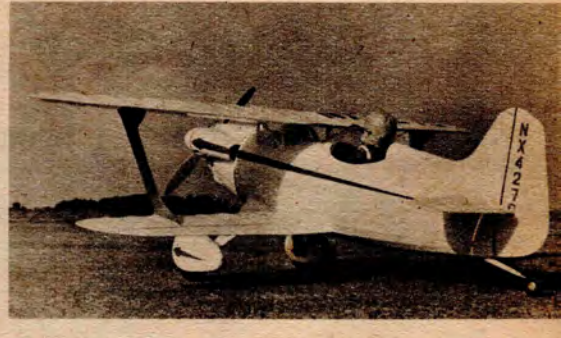
About the most welcome news—and imagine rules changes being welcomed!—is that rules will be tampered with only every second year; thus, the next set of changes will become effective in 1953. This means voting on rule refinements and the addition of new classes will be a more calm and thoughtful procedure than in the past. Generally speaking, we think every modeler will approve of *that* rule.

The A.M.A. further says (and you must remember it was the Academy's Contest Board which decided on the 1951-52 regulations after reading all comments from you modelers) that the use of pure oxygen with fuels shall now be prohibited. This won't disturb anyone except the rocket fans and a few very advanced experimenters who might be working on oxygen injection for their speed models.

Handicaps, unless approved by the Academy, are prohibited. We don't quite understand the why or wherefore of this one. About the only meet with which we are familiar that runs under a handicap system is the New York Mirror's Model Flying Fair (*Continued on page 78*)



Pitts by John Revel of Boeing; pix by R. J. Holm of Spartan School of Aeronautics. As student there, Revel spent 4 mos. on this inverted Hornet powered 44-in. beauty; 4 lbs.



Another lovely: Knight Twister, Jr. by Dick Wilson, Richmond, Ind. Ohlsson 33 g.p.; includes 2-speed; hardwood & silk; stunt tank.

Art Watkins, Seattle, with his 350 sq. in. towline glider; shoulder wing, plug-in type; high stabilizer, underslung rudder.



Len Webb flying in English Bowden free flight contest with 60-in. job. Power, Allbon 2.8 cc. diesel. Colors, pale blue and silver.



Class E rubber-powered cabin by C. R. Wood which set national endurance record of 23.15. He's from Seattle, holds many contest wins.



AIR ADVENTURERS CLUB

Join up with thousands of other young men and women working together in this youth-in-aviation organization to make the United States the most air-minded nation in the world

■ We are happy to report that Headquarters has been swamped with applications for membership in the Air Adventurers Club. From every indication it appears that thousands of Flights and Squadrons will be established across the nation to do their part in making America the most air-conscious nation in the world.

The first in the series of qualification tests for members has been completed. This is being mailed to each new Air Adventurer along with his credentials. The first thing for each new member to do is complete A-A training gliders #1 and #2 and fly them to the satisfaction of some responsible senior individual such as his school teacher, Boy Scout leader, Y.M.C.A. counselor, or an officially accredited model airplane contest director. The applicant holding the rating of Apprentice Class Airman completes the test sheet and returns this to Headquarters here together with his glider flight qualification form. If the member receives a passing grade on his examination and his flying sheet is okay, he receives a new membership card as Airman, Third Class.

The A-A membership pins have received the approval of the Club staff and are now being mailed to all individuals who sent in the extra 25 cents to cover cost and mailing. The official emblem is a very attractive affair with its blue enamel A-A lettering on a gold-plated background.

The central theme of the Club insignia is the famous Wright Brothers memorial which stands at Sky Devil Hill, Kitty Hawk, North Carolina. The memorial was erected to honor the first successful flight of a powered airplane by Orville and Wilbur Wright on December 17, 1903.

The beginning of their dream to fly started in a bicycle shop in Dayton, Ohio, where they first experimented with helicopter models but soon abandoned the effort to start working on a glider. This was in 1896. Four years later, they moved, with their glider, to the barren coastal section near Kitty Hawk, N. C. By 1902, they had made close to a thousand flights with that glider. Having mastered the theory of flight and piloting technique, they turned to powered flights.

All available engines were much too heavy for the power, and they had to rebuild the one that seemed the most suitable to fit their specifications. The Wright Biplane with its 12 hp engine was finished in September, 1903, but it was not until December 14th that they attempted their first flight. With Wilbur Wright at the controls, the craft took off from the tracks of its special catapult. The angle of climb was too steep and the machine stalled, landing on one wing tip, then ground looped, breaking



"I SOLOED AT TWELVE!"

By STEPHEN HOADLEY

■ It was a clear, cool day in September, 1948, when Leon (Red, as we called him) Geer, the instructor at Veterans Airport near Bloomington, Indiana, taxied an Aeronca Champion to the end of the runway. With him a new student sat in the front seat trying to control the excitement that welled up inside him. Red had just finished a small lecture about an airplane and its controls and the use of various other gadgets. The student was going for his first lesson.

Red shouted over the roar of the engine, "Now follow me through on this take-off!" He turned the airplane into the wind and pushed the throttle forward. The Aeronca leaped ahead, and gathering speed rapidly it was quickly airborne, using but half of the runway.

They climbed to 1000 feet and Red explained straight and level flight to the student, such as comparing the angle of the wing tips to the horizon, and other things. Finally he released the controls to his student. As new students go, this one was tense, and therefore having a hard time controlling the (*Continued on page* 68)

THEN WE'LL WORK TO KEEP AMERICA FIRST IN THE AIR

the skid. Man was learning, hard.

It was not until December 17th that the damage was repaired and another attempt made; this time it was Orville who manned the controls. The machine rose smoothly into the air, gained altitude and remained aloft exactly 12 seconds, covering a distance of around 150 feet. An hour later Wilbur took off for the second time, which flight lasted 13 seconds and covered a distance of 190 feet. Two more hops were made that day, the last one yielding a flight 50 seconds and 852 feet distance. On this memorable day the airplane was born. Its top speed was only 30 mph and it could barely carry 200 lbs. of weight. But less than fifty years later, this waddling baby grew into a giant which shrank the world to less than one-quarter size (time-wise) and has become man's most potent weapon.

In memory of Wright brothers' accomplishment, a group of civic-minded North Carolina citizens gathered in August, 1927, to organize the Kill Devil Hill Memorial Association and to erect a suitable memorial to the achievement of the Wright brothers. Congress appropriated $225,000 for the monument and the corner stone was laid on December 17, 1928, exactly 25 years after the first flight above those coastal sands.

So that's the meaning behind your Air Adventurers Club emblem. Wear the pin with pride!

In answer to inquiries, we want to say that the qualification tests for the various grades of membership are not too hard for anyone who has been reading about aviation or has been building model airplanes. Some research may be required at the school or public library, but Headquarters staff feels certain the amount of time spent preparing for each exam will be well worth the member's effort since he or she will be started off on an informative, easy-to-take course of instruction in aeronautics —in a course of paramount importance to every young man and woman preparing to take his or her place in America's all-out air effort.

Members are requested to follow this column each month for instructions on Flight and Squadron activity and to read carefully all the material they receive in the mail.

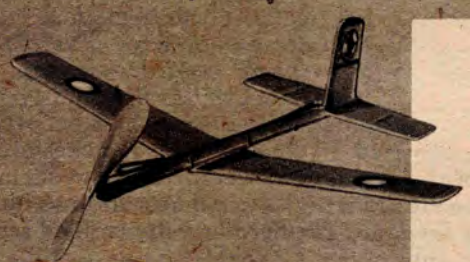
When writing Headquarters, members should include their membership number together with their printed name and address in the upper right-hand corner on the sheet of letter paper. On letters more than one page in length, make sure the number and printed name and address appear on the upper right hand corner of *each* sheet. This is designed to speed up handling the mail and to keep the membership up-to-date on Club activities. —ALBERT J. CARLSON

Your First Powered Model

Those readers who built the A-A gliders described last issue should have mastered the rudiments of flight and the principles of adjustment by now. If so, you will be prepared to tackle the construction of the simplest style of powered model, the so-called "stick" type propelled by rubber bands.

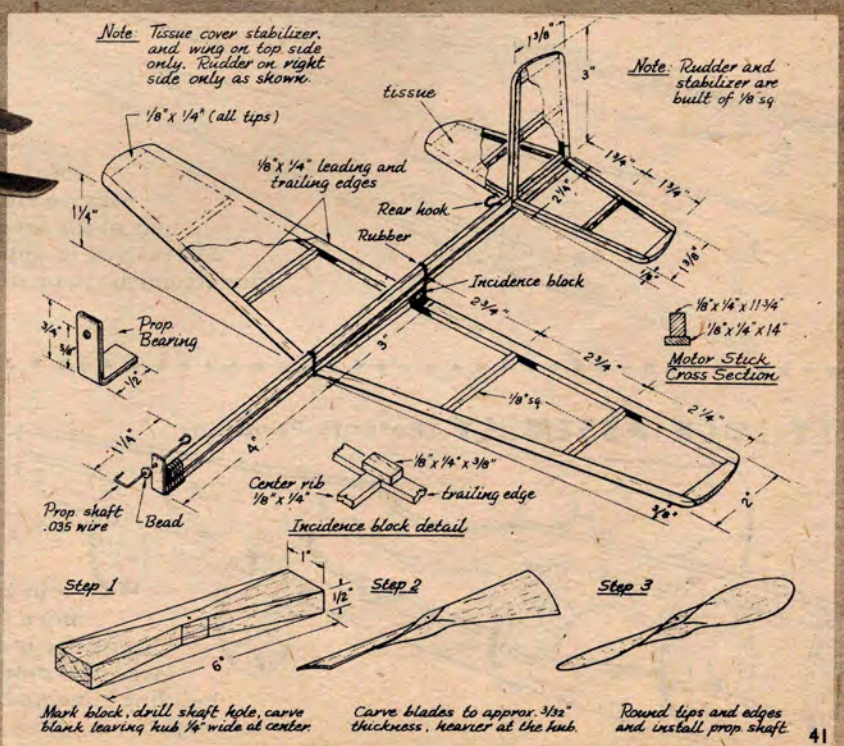
The addition of a propeller and rubber to what will otherwise fly as a glider adds several new forces acting upon your model for which you will have to learn to compensate by means of adjustments. Most important, you'll experience the effect of torque. This is simply the reaction, or opposite force, caused by the propeller as it turns. The torque tends to roll the model over in a direction opposite to prop rotation. The result is that the model will travel in a circular path unless you warp the wings or rudder to offset torque. More of this later, however.

Rubber-powered models have been flown (*Continued on page* 72)



HERE'S A-A POWER MODEL #1

This is the third in the series of official model airplanes which all new Air Adventurers Club members are required to build. As explained in last month's column, the A-A program is not exclusively a model-plane one; instruction models are required only for the first several rating stages. After that the individual member can continue on with models or not as he or she sees fit. Purpose of the building is to give practical aeronautic foundation.

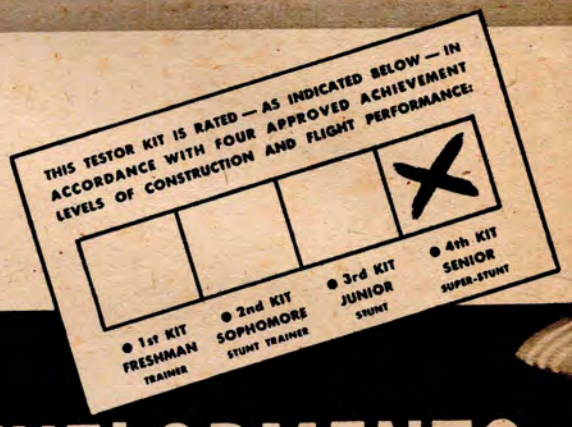


CROWNING ACHIEVEMENT OF THE TESTOR-McCOY PROG
AMAZING PLAN FOR LEARNING MODEL AIRPLANE CON

TESTORS

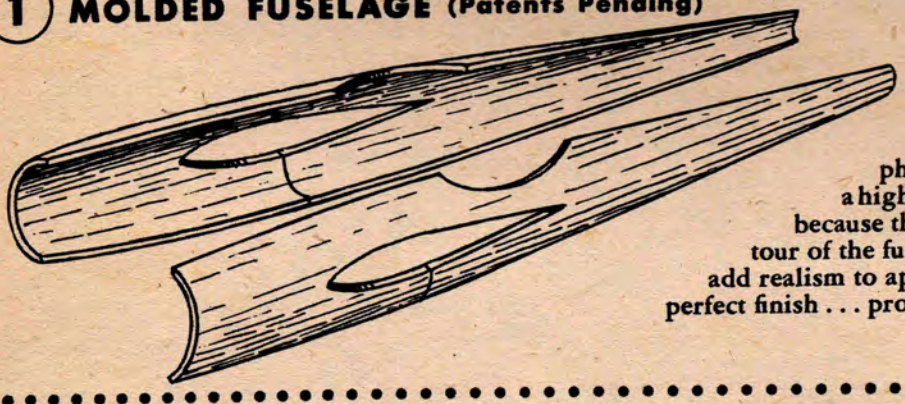
SENIO

. . . in "9", "19", and "29" models for the McCOY "9", "19", and "29" engines



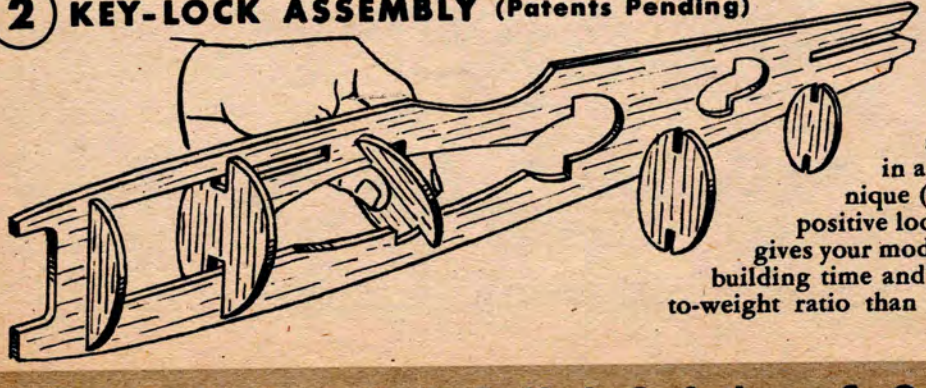
. . . featuring 2 REVOLUTIONARY NEW DEVELOPMENTS

(1) MOLDED FUSELAGE (Patents Pending)



This drawing shows two fuselage half-sections just as you find them in a Testor Senior Kit. *Note that they are actually molded into shape!* The importance of this new and exclusive molding technique cannot be over-emphasized. In the first place, it makes possible a higher strength-to-weight ratio for your model, because the grain of the wood now follows the contour of the fuselage. Furthermore, the molded sections add realism to appearance . . . enable you to obtain a more perfect finish . . . provide more effective structural integration.

(2) KEY-LOCK ASSEMBLY (Patents Pending)



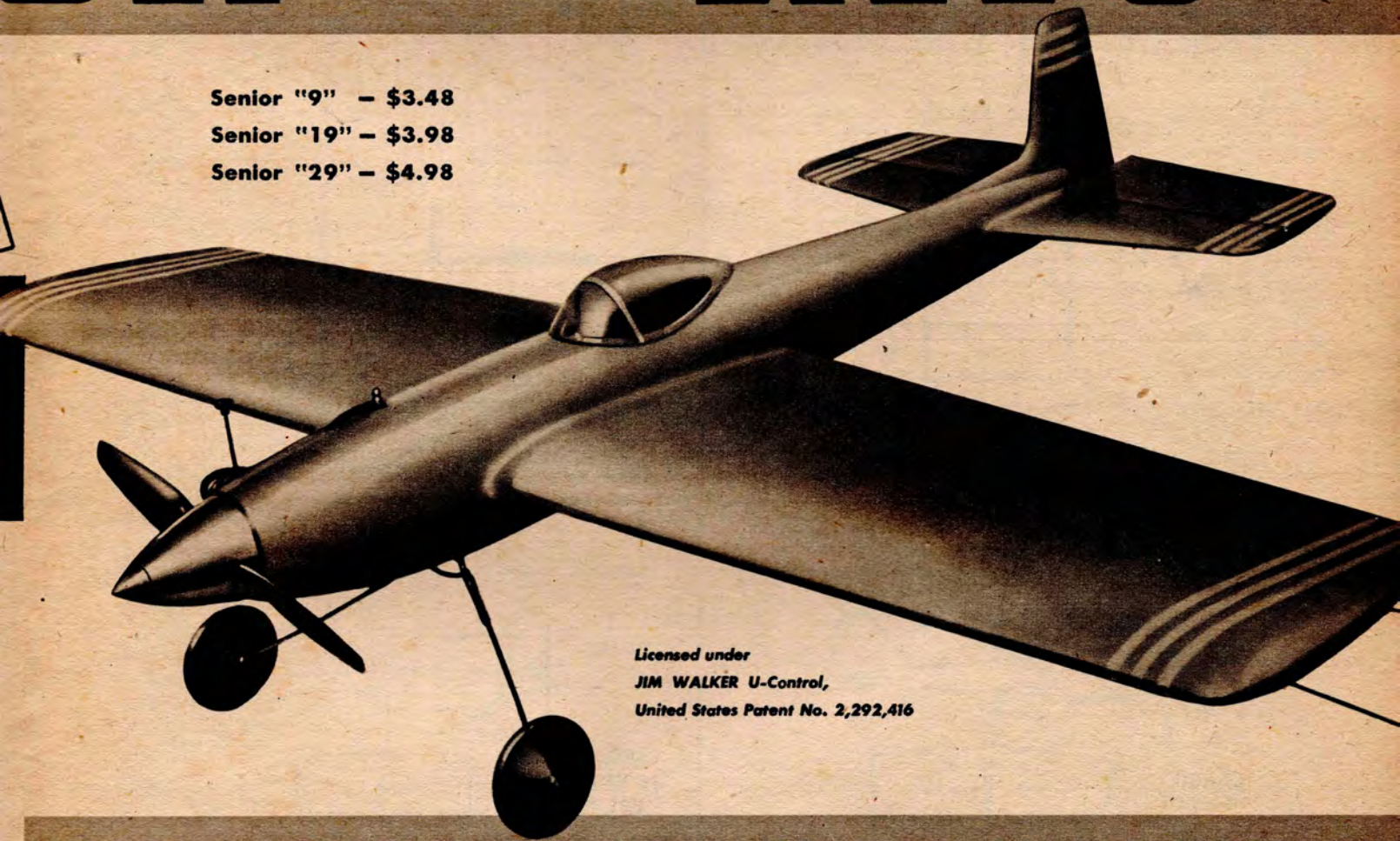
This drawing of keel and formers in a Senior Kit illustrates the construction principle of Testor's new "Key-Lock" assembly . . . shows how formers fit securely into place with the simple slot-slide action of a key turning in a lock. This exclusive construction technique (also used for wing rib assembly) insures positive location and correct alignment of parts . . . gives your model reinforced structural rigidity . . . saves building time and work . . . establishes a higher strength-to-weight ratio than is possible with conventional design.

TESTOR CHEMICAL COMPANY (WOODW

ROGRAM . . . YOUR FINAL STEP TO GRADUATION IN THIS
ONSTRUCTION AND U-CONTROL FLYING SUCCESSFULLY!

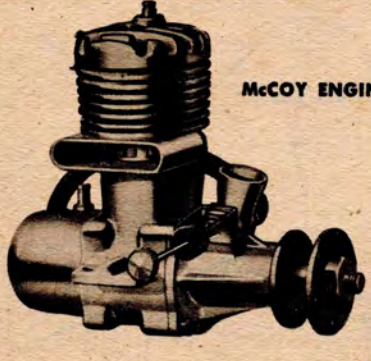
OR SUPER STUNT KITS

Senior "9" – $3.48
Senior "19" – $3.98
Senior "29" – $4.98



Licensed under
JIM WALKER U-Control,
United States Patent No. 2,292,416

YOUR MATCHED POWER PLANT FOR SUPERIOR PERFORMANCE



McCOY ENGINES



McCOY PROPS



TESTOR KITS

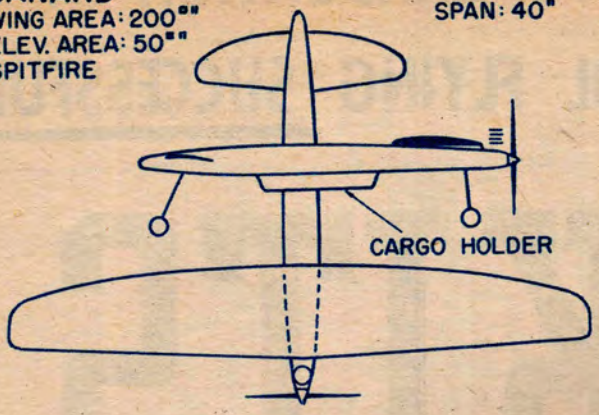
TESTOR FUEL



WORKING DIVISION) ROCKFORD, ILLINOIS

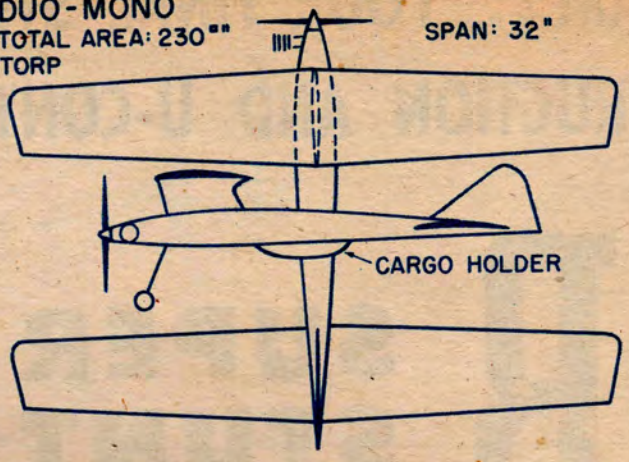
CANARD
WING AREA: 200"²
ELEV. AREA: 50"²
SPITFIRE

SPAN: 40"



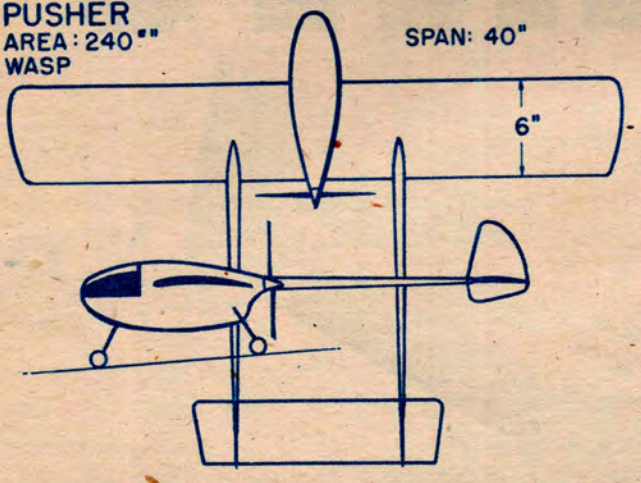
DUO-MONO
TOTAL AREA: 230"²
TORP

SPAN: 32"



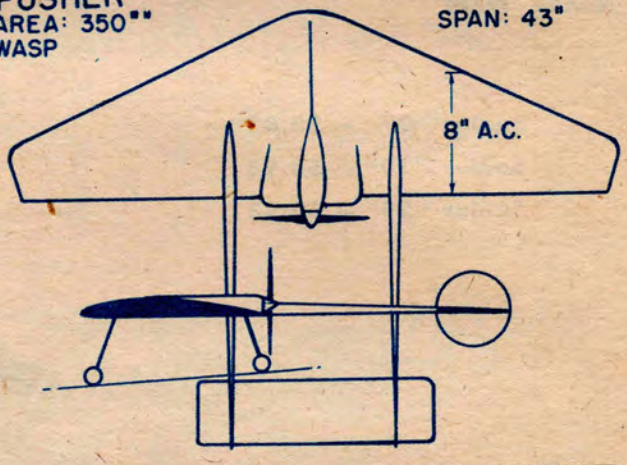
PUSHER
AREA: 240"²
WASP

SPAN: 40"



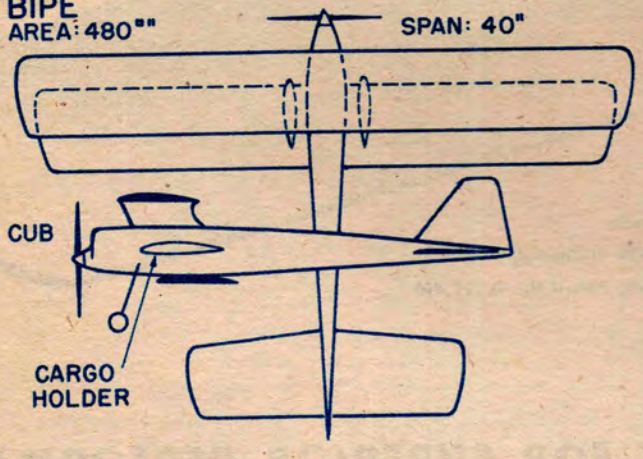
PUSHER
AREA: 350"²
WASP

SPAN: 43"



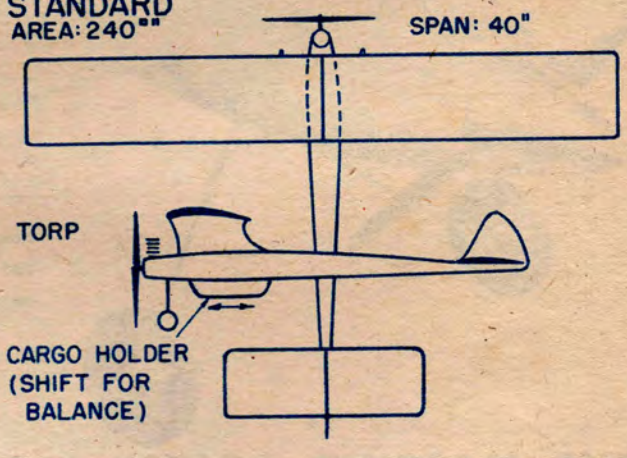
BIPE
AREA: 480"²

SPAN: 40"



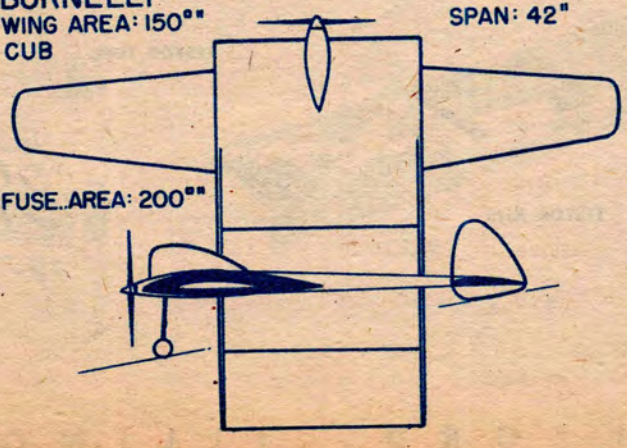
STANDARD
AREA: 240"²

SPAN: 40"



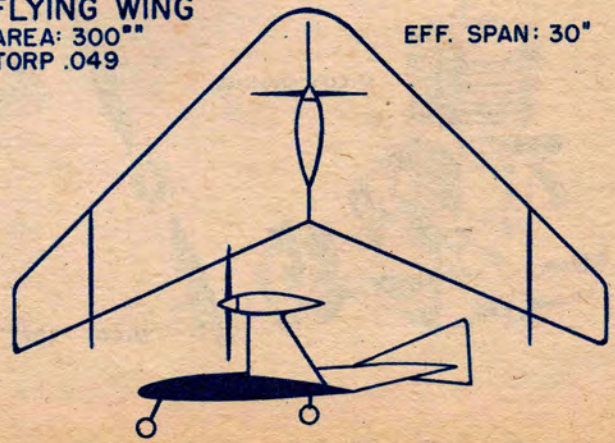
BURNELLI
WING AREA: 150"²
CUB

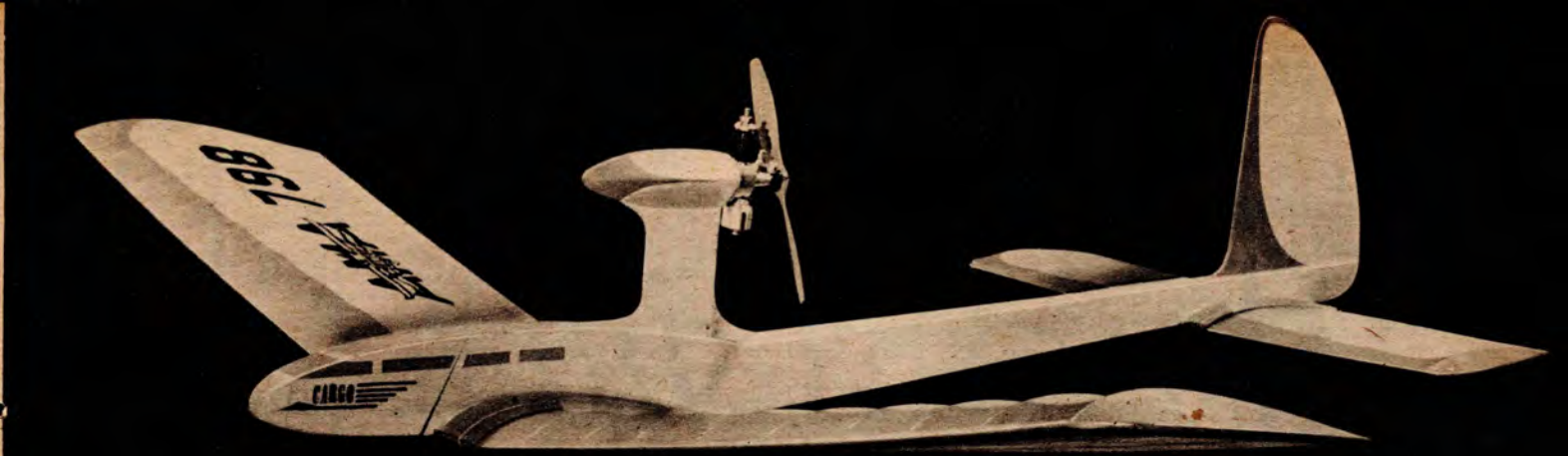
SPAN: 42"



FLYING WING
AREA: 300"²
TORP .049

EFF. SPAN: 30"





Air-Model Design Competition

This month's subject: Pan American World Airways' new Clipper Cargo Event. Read how you can participate in this contest and win money with your design doodles

■ At long last we can make a model without worrying if the dethermalizer will work or not. All we have to do is to make sure that the ship will stay upstairs for 40 seconds; and 20 seconds of this time can be in power flight. But to win the Pan American World Airways Clipper Cargo Event, the model must lift the greatest possible load.

In selecting this particular design for the Clipper Cargo Event, the jury also considered its applicability for regular feeder cargo planes, as well as its various possibilities for radio control and flying boat designs.

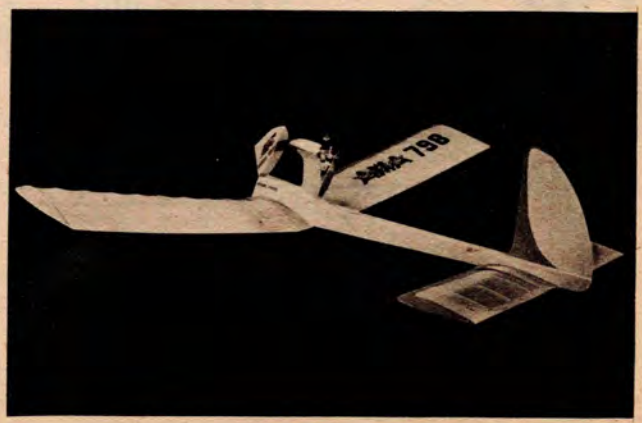
The high thrust line offers several advantages over the conventional type. It allows low wing and short landing gear. The low wing can take full advantage of the "ground effect" on take-offs and landings. This means short take-off run and cushioned landing. Short landing gear makes it possible to present the model at its "flight angle" for the take-off. This will give the engine a chance to bring the model into flying speed with minimum of effort. All of which spells greater payload and safer flying—important "musts."

The main difference in the design of high-powered models and Cargo Clipper is the location of the C.G. This may not seem important now, but it may mean the difference between having an easy model to fly and adjust, or having one with a touchy personality, causing trouble every time weight is added or removed. On high powered models, the C.G. can be anywhere between 75% and 100% of the chord. While on Cargo Clippers, the C.G. should be around 35% point when flying in calm or low breeze conditions.

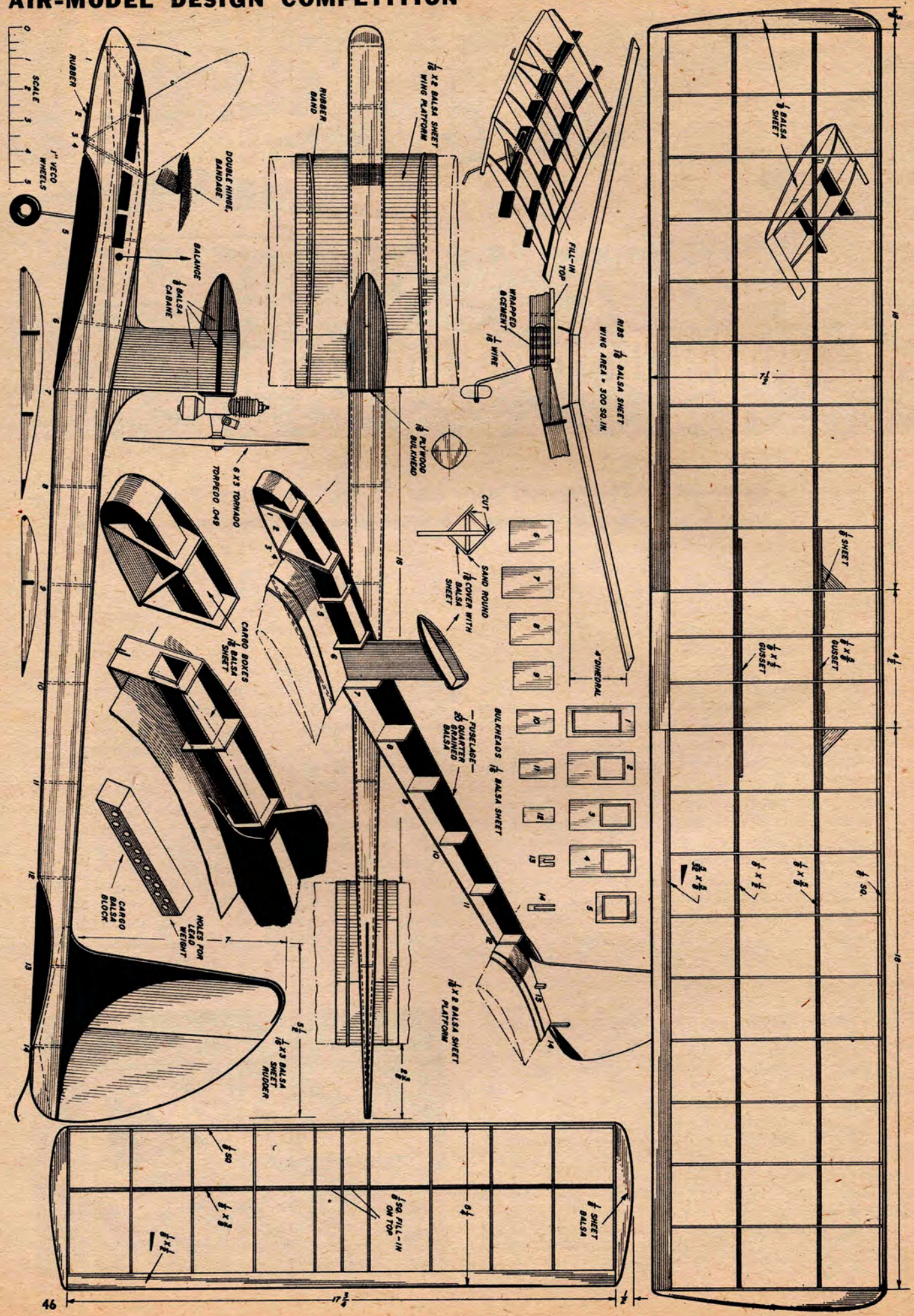
The peculiarities of different C.G. positions are as follows: On high powered models, a slight change in the C.G. position will make itself evident in a dive or stall. But a slight change of C.G. position on the Cargo Clipper will have practically no effect. This means that it is possible to add weight without having it exactly on the button. This will prolong the life of the model and make test flying easy. The test flight will show if the weight was positioned properly, but it will do so gently. *(Continued on page 70)*

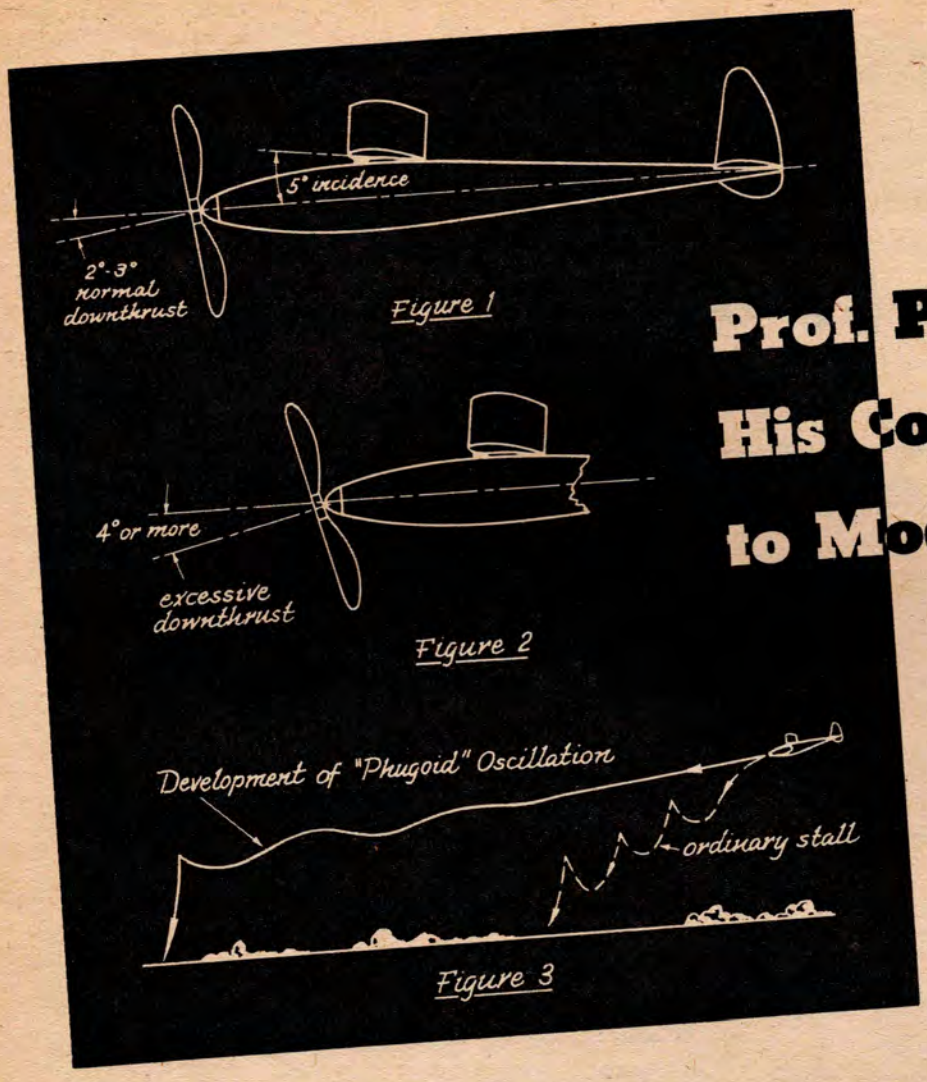
Rules Governing AT's "A-M-D" Contest

You are not required to build a model in this contest! All you do is submit detailed 3-view drawings of your favorite "brain-child." These should be not less than 8 by 10 inches and must contain information on wing areas, spans, fuselage length, center of gravity, weights, power used and the like. AT will select 8 outstanding designs to be presented in 3-view form. Payment of $5 will be made for each published. The top design in each special category will be built and test-flown by AT's design research team; upon completion of the tests the model will be given to the winner. The category until April 1, 1951, is towline gliders; until May 1, .19-.35 stunt models.



AIR-MODEL DESIGN COMPETITION





Prof. Phugoid and His Contribution to Modeling

You may have read many articles on adjustment, but we say this is the most important ever to be presented . . . peruse and profit!

By WM. F. McCOMBS

■ Many well-built and well-proportioned models are unable to give the best performance of which they are capable simply because they have never been correctly adjusted or trimmed for flight. In fact, as is well known, a very large number of models are destroyed or severely crippled in the initial test flying stages.

It is the purpose of this article to give the reader, whether his experience be extensive or limited, an understanding of how a completed model can best be adjusted for flight. It is also intended to point out how to observe from the flights what features of the design should be corrected or changed.

Before making test flights on any free-flight model, rubber or gas, the thrust line or axis of propeller rotation should be tilted down two or three degrees, as in Figure 1. This is called adding downthrust.

Longitudinal trimming is done to correct any stalling or diving tendencies which may be present and to secure the best duration of flight. It is important to understand that in all cases the model must be trimmed in such a way as to take care of two flight conditions: (a) flight without power, that is, in the glide, and (b) flight with power applied, that is, with the propeller turning and driving the model.

In all free-flight designs, rubber or gas, the leading edge of the wing should be tilted up so that there's an angle of four or five degrees between the wing chord line and the centerline of the fuselage as shown in Figure 1. This angle is called the angle of incidence from the fuselage, and the amount mentioned will result in the fuselage having the smallest drag or resistance to the airstream in flight. This is because the angle of attack of most airfoils used in models is around four or five degrees for best duration (minimum sinking speed).

Consider the case of a typical rubber contest model of the tractor type (propeller in the front). First, the wing is strapped onto the fuselage at what is believed to be the correct position. As a first guess, this may be at a point where the model will balance midway between the leading and trailing edges of the wing. Enough incidence is then added to give the four or five degree angle mentioned above.

The model is then glided gently into tall grass and the flight path is noted. If the tendency is to dive in, the trailing edge of the stabilizer is blocked up slightly. This is called putting *negative* incidence into the stabilizer. If the tendency is to stall, the leading edge of the stabilizer is blocked up slightly. This is called putting *positive* incidence into the stabilizer.

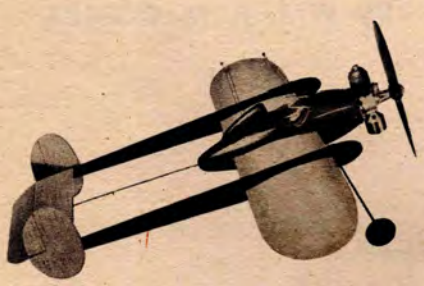
Note (*Continued on page* 56)



Whee-38!

By LOU BYRON

Pressed for time? Short of cash? Don't worry. This is about the quickest, least expensive control line model you could turn out



■ "High control-line performance from Half-A's?" "Impossible," was the answer heard at a recent club meeting. "Too small, too heavy for any satisfactory type of performance," came the verdict of the majority opinion of the local experts.

Summed up, the gang decided that the problem of hot performance with Half-A's seemed to be the old bugaboo of wing loading. Small models are infinitely more difficult to build with a light wing loading than the larger jobs. This rub applies to both free-flight and control-line models.

Whee-38 beat the high wing loading hex by the use of a simple sheet balsa built-up wing and the pod, boom weight-saving configuration of the World War II famous Lockheed P-38 fighter. The result: a zooty-looking little job with performance plus using any of the .049 and under displacement engines, and all much to the chagrin of the "no-can-do" boys.

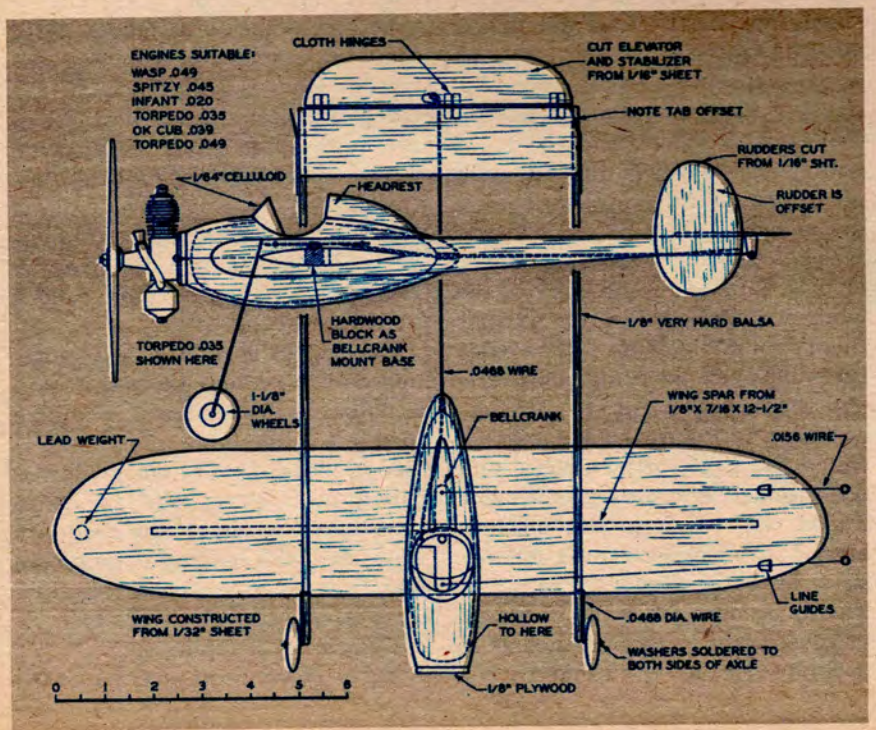
Any of the radial-mounted engines such as the Wasp, Cubs, Infants may be used. Consult the listing on the plan. The K&B .035 displacement Torpedo was handiest, so we installed that.

All parts are shown here full size, hence the elimination of the tedious task of enlarging. Simply trace off by the use of carbon paper the outlines on to the wood. Begin with the wing construction which consists of only three individual pieces, top and bottom surfaces, with a spar sandwiched in between to form the airfoil contour. This is the simplest building method.

Lay the bottom sheet on a flat surface and cement the spar which measures $\frac{1}{8}$" x $\frac{5}{16}$" x 12½" in position. Now add the top sheet to the spar and line up the leading and trailing edges. When dry, cement along the edges and presto! —the job is finished.

The booms are cut from extremely hard $\frac{1}{8}$" sheet. If this is unavailable, use a $\frac{3}{16}$" sheet of less hard material, but still try to pick the hardest obtainable. Assemble the booms on the wing and align carefully. Add stabilizer, which again should be cut from extremely hard $\frac{1}{16}$" sheet or $\frac{3}{32}$" sheet of softer grade wood.

The pod is carved from the lightest softest wood obtainable to save weight. A $\frac{1}{8}$" plywood disk forms the firewall and motor mount. Note that the diameter can be varied to fit the mounting requirements of the particular engine you are using. Check carefully to see that the firewall is aligned properly. Any side or downthrust should be eliminated.



The elevator and two rudders are cut from soft stock. Use Flightex hinges to attach elevator to stab.

Attach the bottom half of the pod to the wing at the centerline and then install the bellcrank assembly. Check to see that it is free moving and as frictionless as possible. Add the top of the pod, headrest and windshield.

The outboard wing is counterbalanced by a small amount of solder as indicated on the plan. Add line guides to inboard wing.

Doping and finishing should be undertaken carefully with the use of plasticized dope to prevent warping of the thin surfaces. Three drops of castor oil to every ounce of dope will retard extreme shrinking qualities, prevent warping.

The original model had a yellow wing, elevator and rudders with black pod and booms. Do not overload and build up the weight by excess doping. Two coats are plenty of coverage for a small model of this type.

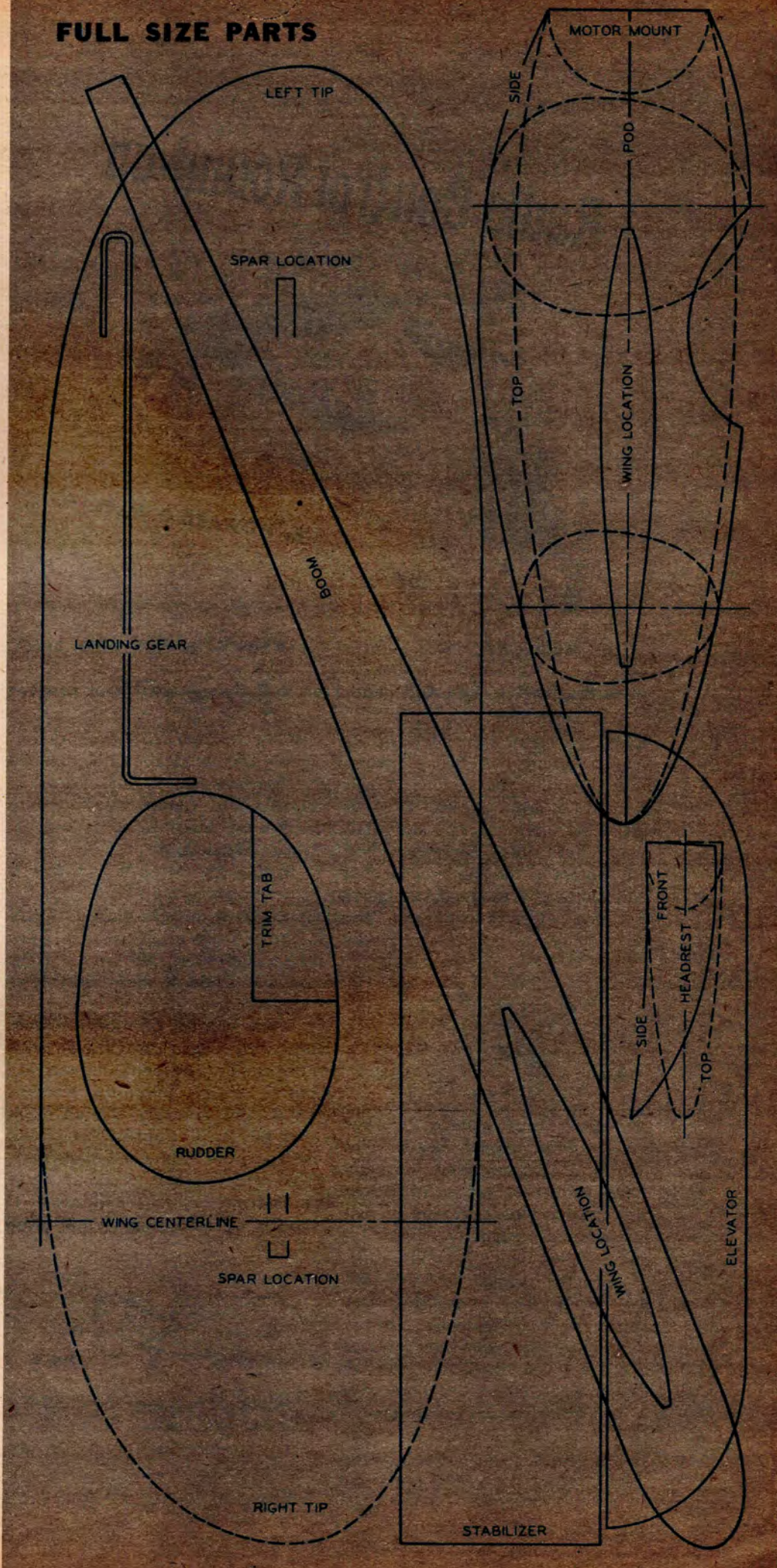
Look carefully before the first test flights to see that all surfaces are accurately aligned and that the control system operates smoothly.

Check your *Whee-38* out cautiously. After a few trial circles you'll think you have an actual P-38 at the end of those wires.

This model is especially recommended for those modelers who have not tried their hand at a really small Half-A as well as for the beginning crowd. Main difficulty with the first small A/2 craft was that the early engines were not as powerful as the latest powerplants; another general mistake was too small a wing area to support the load. As indicated, you want to keep the weight down as much as possible and judicious selection of light, tough balsa will enable you to do just that.

After you've completed and test-flown your *Whee-38,* try your hand at picture taking and send in photos of your model. Flight shots will be especially appreciated by the editors who are always on the look-out for outstanding air-model art work.

FULL SIZE PARTS





Modeldom's most colorful event has an exciting past; here's an authoritative, updated report on R-C flying—past and present

■ Radio control of models is not new. Despite the idea of many model builders that R-C work was discovered around 1937 or 1939 with the holding of the first R-C event at an A.M.A. Nationals meet, the control of models by means of radio actually was an accomplished fact long before World War I. The early pioneers did not use model



Fig. 1

airplanes, but instead worked mainly with model boats. The planes of that day were virtually 100% rubber-propelled, of course, and the hardwood-framed models had enough weight to carry without addition of radio apparatus.

Since the modern vacuum tube was not available in practical form before the First World War, the experimenters in older days utilized a cranky and unreliable receiver known as a coherer-decoherer. For transmitting the principal element was an induction coil, operation of which was invariably accompanied by crashing sparks and fireworks of all kinds. Ranges reached were only a few hundred yards, but yet it *was* Radio Control.

During and after World War I, experiments in radio control of airplanes—not models, but the equivalent of today's lightplanes—were quite successful, and some slight use was made of these aircraft as target planes.

Radio control of model planes, however, began in earnest soon after the development and marketing of reliable miniature gas engines, and progress was so rapid that the Radio Control Event was added to the Nats schedule in 1937. This was the 10th National Meet at Detroit and half a dozen R-C models were entered. While three

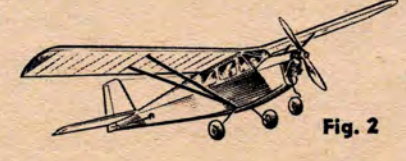


Fig. 2

of the ships managed to get off the ground, two crashed immediately after take-off. The only really successful entrant was Chet Lanzo; his plane (Fig. 3) was a simple stick model with an open fuselage built in crutch shape, and the 9 foot wing mounted on a wire "pylon." Power was furnished by a Baby Cyclone engine and the airplane weighed 5¾ lbs. ready to fly.

After checking the possibilities of aileron, elevator, and rudder

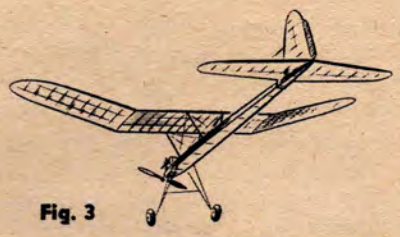


Fig. 3

controls, Lanzo settled upon rudder only as the most practical, possibly starting a trend that continues to this day. The complete control installation weighed only 1¾ lbs., a phenomenally low total in a day when most R-C men felt 5 or 6 pounds was the irreducible minimum. The complete control equipment may be seen in Fig. 8; the long balsa tray containing the entire receiver fitted between the two fuselage members; second from lower right is the tiny 45V B battery, which had a life of only about two weeks, whether you used it or not! Batteries fitting into the fuselage in front of the receiver, and the rudder motor and gears were just to the rear.

The radio system operated in the

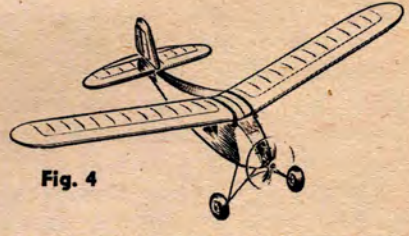


Fig. 4

80-meter (3.5 mc.) Amateur band, and the receiver often responded to signals from Amateur transmitters several hundred miles away! The motor was geared down and linked to the rudder; if allowed to operate steadily, the rudder would turn alternately right and left. It could be stopped at the straight-ahead position, or at any intermediate degree of right or left turn up to the full range of motion, and thus acted as a slow-motion motor driven sequence control.

The 3-tube receiver included an oscillating detector and two audio amplifier tubes; unmodulated pulses from the transmitter caused an audio beat note when received

Out to Launch: Photo, top, shows Walter Good launching *Big Guff* at Minneapolis Nationals. Brother Bill's at xmtr (see feet?)

by the detector, this audio note serving to nullify the high C bias of the amplifier tubes and thus causing a sensitive relay to operate on the resultant increased plate current. Tuning was critical, but Lanzo made many successful flights with the system. The plane flew nicely and control was good enough to win the Event, netting Chet two trophies and an engine.

In the summer of 1937 a group of radio men led by Ross Hull of

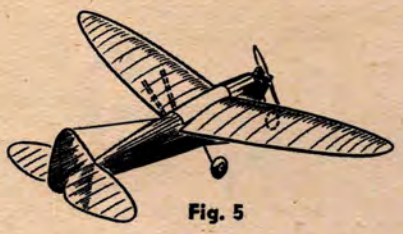


Fig. 5

the American Radio Relay League began active experiments in the Radio Control field, and the equipment they developed left an indelible print on R-C work that is still felt today, some 14 years later. Their original work was done in Connecticut and large model gliders were used almost exclusively. They decided at the outset to confine operations to the Amateur 56 mc. band, and 95% of R-C work today is still done on the

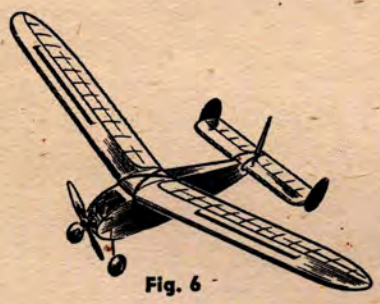


Fig. 6

present equivalent band, 50-54 mc. Their greatest "masterpiece" was development of the magnetic escapement to operate their rudder surfaces; here again, probably at least 90% of R-C planes flying today utilize an escapement in some form.

The Connecticut group originally used 2 and 3 tube receivers, but felt the need for something lighter and simpler. This "something" they helped to develop in 1938; it was the forerunner of the RK61 tube so popular at present. Another collaborator, Clinton DeSoto, formed a concern shortly after that which dealt exclusively in radio control apparatus, the first firm to specialize in the new field, in which it is still actively engaged today.

Hull and his co-worker, R. B. Bourne, had planned to enter a high-performance model soaring glider at the annual glider meet in Elmira, but rules technicalities prevented this. However, the sleek 16-foot model made many successful exhibition flights.

As the 11th Nationals rolled around, the R-C boys had great hopes for their various systems, but unfortunately the R-C Event was the victim of that uncontrollable factor—windy weather—which has plagued R-C contest flyers right up through 1950! The only ship to fly was that built by Walter Good, and it cracked up shortly after take-off. Walt had had the same airplane at the '37 Nats where he gave a successful demonstration of his equipment on the ground, but didn't attempt a flight. The same plane and radio

Fig. 7



equipment were used in 1938—in fact, this plane, shown in Fig. 4, is the same used by Good right up to and including his win at the 1947 Nats in Minneapolis!

We should probably say it's an "equivalent" plane, for the original 8-foot *Big Guff* received a new fuselage in 1938, new tail surfaces in 1939, and new landing gear in 1947, plus various motors along the way. It is still in good flying condition as this is written, and has become so famous in R-C circles that it is to be offered to the Smithsonian Institution as an addition to their model collection. *Big Guff* has a deep and spacious fuselage to carry any required radio gear and total weight runs about 8 lbs., depending upon the equipment carried.

Walter Good was joined in 1939 by his brother, Bill, a licensed radio Amateur, and the Goods have been a famous team ever since.

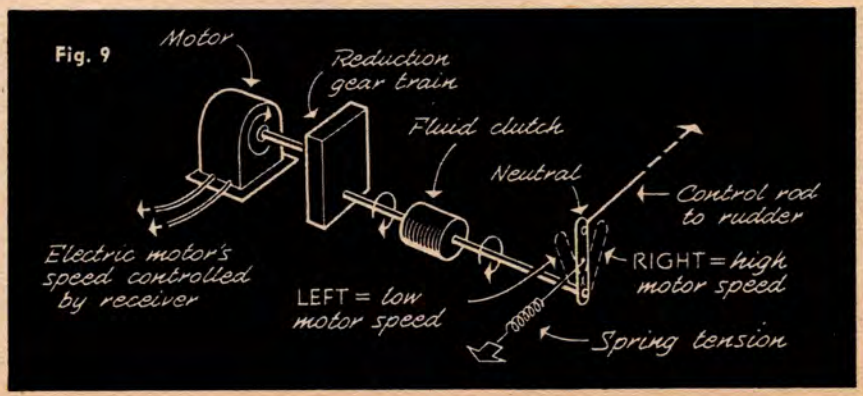


Fig. 8

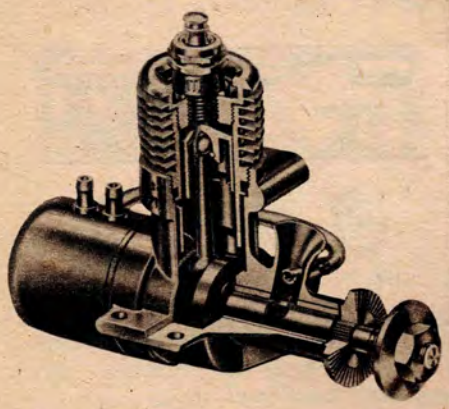
Several other interesting planes appeared at Detroit that year, one of the most awe-inspiring being the "model" built by DeSoto. Of semi-scale design, this cabin job had a 14-foot span, weighed about 28 lbs., and was powered by a special Forster twin-cylinder engine which developed nearly one horsepower. Four separate receivers using RK62 tubes were fitted, connected so that one radio channel each was used to give right or left rudder, and up or down elevator. Though he didn't fly the monster at the meet, DeSoto was awarded second place after he had demonstrated that this equipment was fully workable.

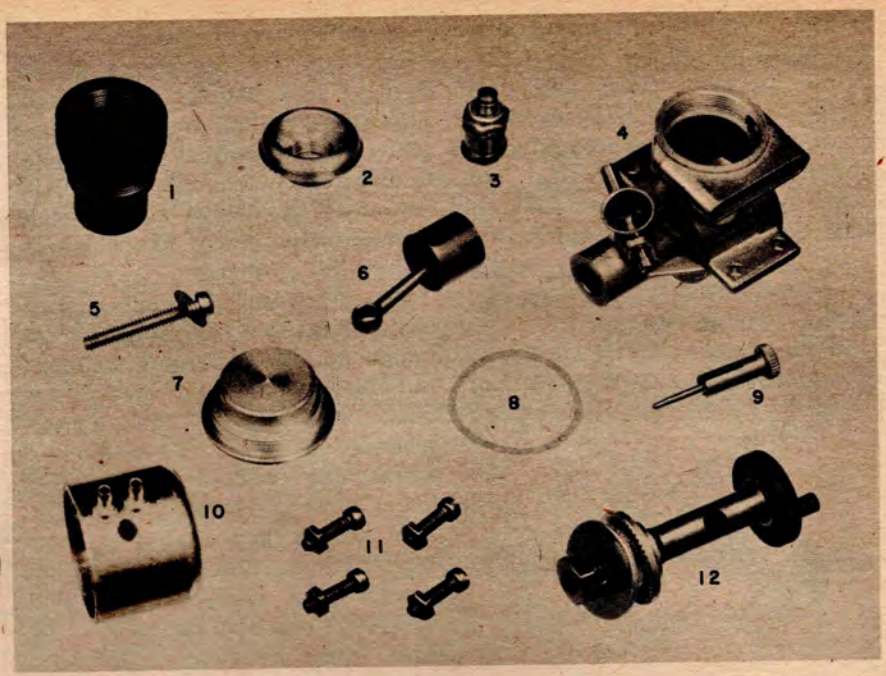
In 1939 at the 12th Nationals, again held in Detroit, the first demonstration of what radio control could really do was given by the Good brothers, who made turns at will, figure 8's, and ended with a landing only 100 feet from the take-off point. This flight clinched first place for them. Although the *Big Guff* carried twin-channel equipment for actuating both rudder and escapement (it was, in fact, fitted with twin-channel apparatus from 1937 through 1940), only the rudder channel was ever (*Continued on page* 62)

Fig. 9



Motor of the Month





ROYAL SPITFIRE

Mel Anderson's new powerplant joins distinguished family

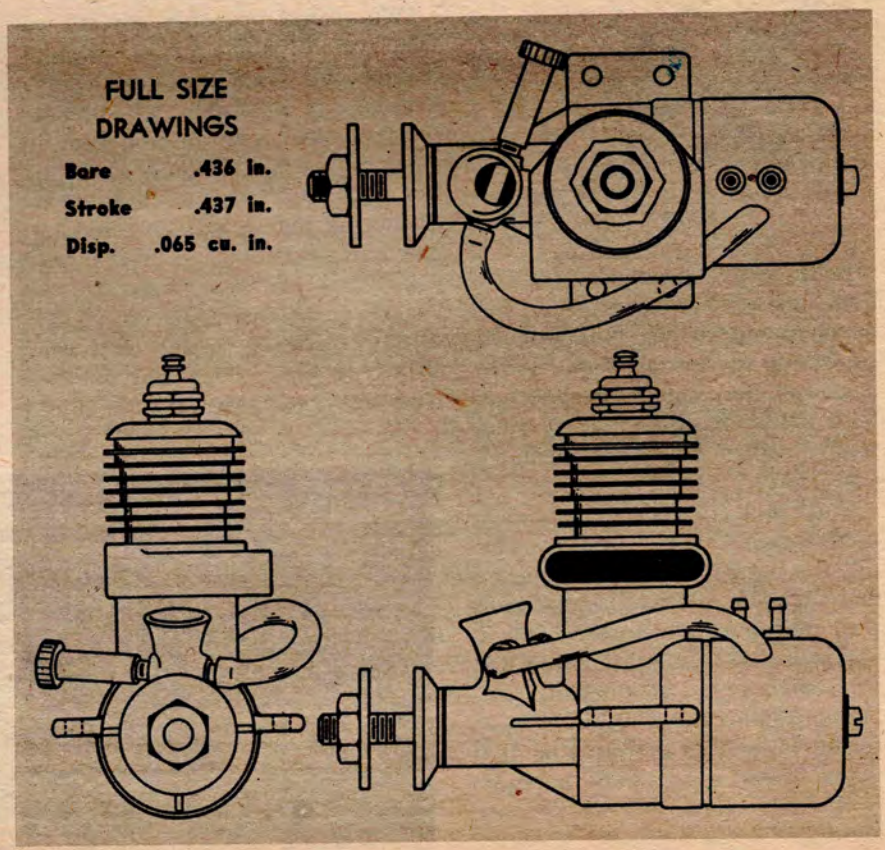
■ During the past year engine manufacturers have been in a race to produce the cheapest Half-A engine on the market. This has brought many new members into the model airplane hobby, but now Mel Anderson takes a step in the other direction. His new *Royal Spitfire* fits in the medium-price class with top-notch quality and performance as the keynote.

The new Spitfire is sold in "packaged" form with nothing left out. Included in this kit are: engine, propeller, fuel tank, glow plug clip, mounting bolts, and a wrench that fits the glow plug, prop washer, cylinder head and back cover plate. The exhaust stack is a notable feature appearing for the first time on an engine smaller than .09 displacement. High power and easy starting are among the outstanding features. Some high-speed engines are difficult to start but the *Royal Spitfire* will kick off in a few flips whether it is cold, or red hot from a long run at 16,000 rpm.

Model airplane fans should find many applications for this new engine. Control line flyers should be pleased with the high-speed stamina resulting from a large bronze bushing for the main bearing and hardened steel connecting rod bearings. The ability to turn a large propeller at high speed makes this powerplant capable of pulling heavy sport or beauty models.

Beauty ships and any good-looking control line model with an engine cowling will perform better with the new exhaust stack, rather than having exhaust heat and oil damage the inside of the ship. The 8" fuel level test indicates the *Royal Spitfire* would be suitable for small stunt ships as well as any type of sport or beauty plane. The built-in tank can be easily removed when a larger tank is required for long flights.

Free flight fans should find the *Royal Spitfire* a satisfactory powerplant. At speeds between 12,000 and 14,000 rpm this engine will turn a surprisingly large propeller. Above 15,000 rpm there is very little increase in speed when smaller propellers are used, so this speed range should be avoided. The built-in fuel tank gave 1½ minutes engine run at 14,000 rpm during the test, and this is ample for any type of contest or sport free (*Continued on page* 76)





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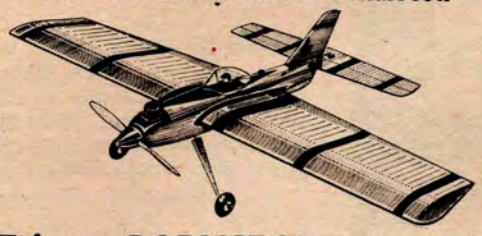
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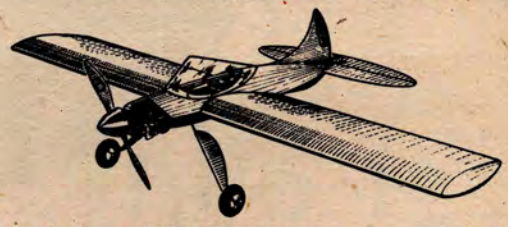
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■ After hearing a lot of talk about shortages due to the war situation and some statements about various manufacturers not making engines any more more, we felt it best to go to the source and find out if it were true, since another contest season is about to get under way.

In the Los Angeles area we found the following: Bill Atwood, who is teamed up with Bob Holland, former national champ, has a good supply of materials coming in, supplies that were ordered some months ago. Bill feels that he has enough to build quite a few engines. The B-B micro tank for the Half-A Wasp should be on the market in quantities soon.

From the Atwood Manufacturing Co. in Pico, we drove across town to the Anderson Manufacturing Co., producer of the Spitfires. Mel was hard at work. His new engine, the *Royal Spitfire,* was in the well-known mass production. Mel has several old-timers in the model game working with him—and Mel stresses the *with* part of it; guys like Ace Boultinghouse, who always flies a monster 1400 sq. inch Spit job at all meets, Bud Kelley, and Russ Beattie.

We had the opportunity to run Mel's new *Royal Spitfire* which is of .065 displacement. The starting was easy, the running smooth—Strobotac showed 13,800 with 6/4. Mel is building this engine to supply the little extra that a lot of fellows want for that slightly heavier and larger ship. The Anderson timer valve was also in work. They have improved this new timer with a sponge valve of new material and new springs. Mel wants to pass on the tip that it is very important to keep the adjustment screw out of the exhausted fuel and well protected at all times.

A short drive from Anderson's, we contacted Irv Ohlsson of O&R and found the last run of engines going through the machines. They have a very large supply of spare parts so that there will be no need to worry about repairs. They also have plenty of fuel, race cars, universals and engines on hand.

From O&R we drove down to Compton to see Bill Cranford who produces the Zeek & Zebins. Bill's only shortage is for paper covering, but he expects to be able to supply the demand for quite some time.

—DICK EVERETT



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Prof. Phugoid

(*Continued from page 47*)

that the position of the wing is not changed to correct for diving or stalling tendencies as is so often recommended. Several more hand glides are then made and the stabilizer setting corrected in the above manner until a smooth steady glide is obtained. This only represents a first guess for correct gliding trim since the model must glide in smoothly from 30 or 40 feet of altitude before we can be fairly certain the trim is correct.

The next step is to put 40 or 50 hand winds into the motor, launch the model from the hand, and observe the flight path. Suppose that it climbs up a little, then begins to stall under power or hang on the prop, but finally manages to recover and glide in smoothly when the power gives out. This means that the gliding trim is pretty nearly correct but that the "power on" trim is not. The most commonly used method of correcting such a condition is to add excessive downthrust, eight or ten degrees or more, until no stalling under power shows up as in Figure 2.

This is not at all the most efficient manner of adjusting. When a model is trimmed for good glide but noses up under power with two or three degrees of downthrust, the real trouble is that the model is too stable. It is an established fact that both large-scale aircraft and models which are quite stable tend to nose up considerably under power when they are trimmed for a good glide. While it is true that the usual manner of adding excessive downthrust will relieve this effect, it will not produce best duration results.

The nose-up tendency is best corrected by making the model less stable. This is done by moving the center of gravity or balancing point to the rear, or by making the model balance at a point that is further to the rear with respect to the wing. Of course, this adjustment will destroy the glide trim and the model must again be trimmed in the glide for the new location of the center of gravity by changing the stabilizer incidence as previously described.

Continuing with the case of our rubber model which at present balances at a point halfway between the leading and trailing edges (at the 50% chord point), the next step is to de-stabilize the model slightly and thus reduce the nose-up under power tendency. This is done by shifting the wing forward about one quarter of an inch. The model now balances at a point one quarter of an inch further to the rear. The glide is checked and a slight stall is noted, which is trimmed out by stabilizer setting change.

Another test under power is tried and it is seen that there is still a slight stall under power, but that it is not nearly so severe. Another shifting forward of the wing is made and, after trimming for glide, the model is seen to climb steadily and glide smoothly in.

Successive flights under increasingly larger number of winds are made and in each case a smooth flight is obtained. After two or three hundred hand winds have been tried the winder can be used until the maximum number of turns of which the rubber motor is capable have been used. The correct position of the wing on the fuselage is then marked for future assembly. After this

(*Continued on page 59*)

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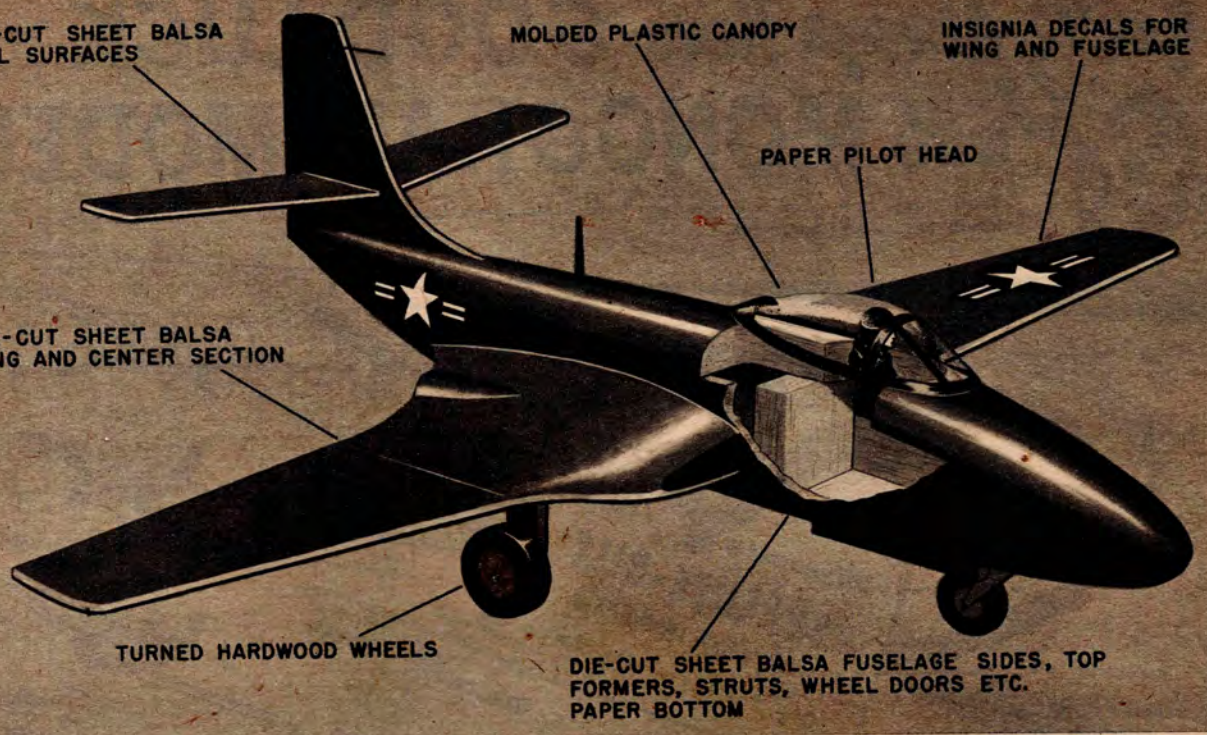
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Model of the Month





Banshee



Guillow's F2D-1 is one of 12 two-bit kits that put inexpensive solid models on prefab basis



■ Though you might not guess it from a glance at the stacks of free flight and control-line kits on your dealer's shelves, solid-scale models still represent a respectable percentage of all model sales. One of the concerns that has helped keep the solids moving is Paul K. Guillow of Wakefield, Mass. This organization has pioneered in low-priced kits since long before the war (the 1941 war, that is!) and has long specialized in scale models, both flying and nonflying.

Way back in 1937, for example, this concern under the same name and at the same location as today, was advertising "8-inch Shelf Model Construction Sets" at two for 35c, and there were six different designs from which to choose. Though these old kits included cement, as did most all kits sold in those days, they *didn't* feature the die-cut parts and moulded plastic canopies you get now. Considering the price levels of today, it is obvious that the present twenty-five-centers are real value.

Of course, if 25c is a bit too rich for you, Guillow has the answer to that, too; he offers a line of 12 different scale shelf model kits for only 10c each. Still too much money? O.K.—you can get a scale Thunderjet glider for only a nickel! Think of that—a prefabbed flying model for what it costs to make a local phone call! (Exempting ol' New York City, of course.)

Our Model of the Month, the McDonnell Banshee, is one of the twelve 25c nonflying kits that Guillow offers. All are military types, though the C-69 (Lockheed Constellation) can be finished in commercial airline colors if you prefer. All but two of the kits are single-seater military planes, and they run from old favorites like the Curtiss P-40 and Republic Thunderbolt right up to the latest and hottest jets.

All the kits feature exactly the same type of construction. Fuselages are built up from 1/16″ balsa sides, with tops and formers of 7/32″ balsa. All parts are die-cut, and the 7/32″ blocks, in addition, have each cut-out part clearly identified. The basic balsa complement of every kit is two sheets of 1/16″ stock and one of 7/32″. The more complex planes, including the Superfort, Constellation, and P-38, include another sheet of heavy wood.

It's hard to describe construction of one model without including all the necessary and interesting deviations required for corresponding parts on others of the series. We'll run quickly through the Banshee, and it can be understood that equivalent building methods are used for all the other models. Let's say that we have gotten fuselage sides and (*Continued on page* 60)

(*Continued from page* 56)

all trim adjustments should be made by changing the stabilizer incidence for glide and by offsetting the thrustline to the right or left for changing the amount of turn under power.

The important thing is to determine, as described, where the wing should be located on the fuselage and to hold this for future flying.

It might have happened in the case of the rubber model just described, that, upon being flown under power for the first time, the model would dive into the ground. This would indicate that the model was not stable enough, and the trouble should be corrected in a manner just opposite to that previously given. That is, the wing should be moved rearwards a little, the stabilizer incidence changed to trim the glide and another low power flight made. This process is repeated until smooth power flights and glides are obtained, the number of winds being increased with additional flights until maximum winds are put in.

It should be noted that adding weight to the tail to move the center of gravity to the rear has the same effect as moving the wing forward: both operations decrease the stability of the airplane. And, by the same token, it is true that adding weight to the nose, which moves the center of gravity forward, has the same effect as moving the wing to the rear: both actions *increase* stability.

Further discussion of the subject will be found in a forthcoming issue.

Army Aviation

(*Continued from page* 28)

this service may work toward an Army commission in the Reserve or ROTC and may take civilian flight training. Then they may apply for the Fort Sill course.

Flying Jeeps

Many Army officers would like to expand the use of lightplanes considerably, to make them nearly as plentiful as jeeps on the battlefield and teach all combat officers to fly.

Many uses are foreseen, especially if plane designs are improved by the addition of known devices for slower landing so they can land or take off within a short run. Thus landing strips, fairly easy to clear for present models, could be made more easily.

Many of the uses now planned for helicopters, such as evacuation of wounded, would be within the capabilities of improved light aircraft.

In addition, some combat use could be effected. Present lightplanes are superior to many of the fighter types of World War I. In World War II, they proved it by going to sea with bombs on CAP coastal patrol.

Most of the Army lightplane flights have been unarmed except by carbines or pistols carried by the pilot and co-pilot, with maybe a few grenades to drop over the side. Lightplane enthusiasts want to add rockets, or at least bazookas, and other tank-destroying armament.

Our guess is that some of these things will be done. Meanwhile, the Army, though still obliged to accept the designs made by the Air Force, has been able to lift the weight limit previously clamped upon its aircraft.

Limited purchase of the Canadian DeHavilland Beaver, the versatile seven-place bush plane, for example, has been authorized. Larger helicopters also are being ordered as the Army, like the Marines, spreads its windmills as well as its wings.

To those who choose the Army—or are chosen—there may be a lot more aviation opportunities than heretofore.

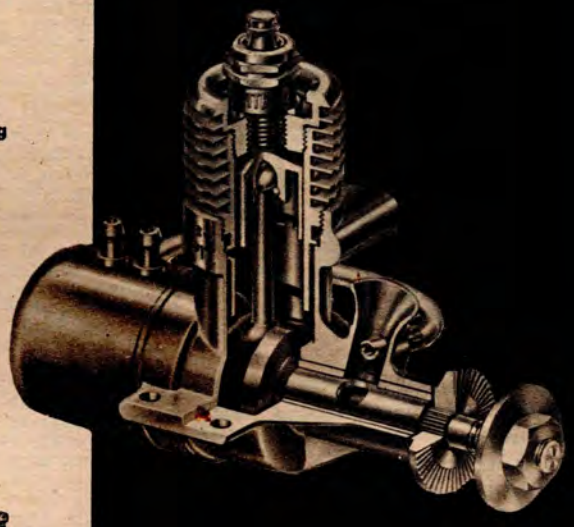
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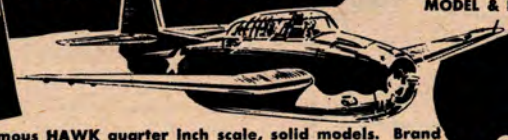
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Banshee

(*Continued from page 58*)

formers assembled. Next come the top blocks, cut from 7/32" stock so they can be nicely rounded to shape. Nose and tail blocks complete the fuselage assembly, which is then trimmed and sanded to correct overall shape.

The fuselage bottom on this ship, as on most of the others in the series, is simply a piece of paper cut out from a marked area on the plan. Though some purists might object to this, a shelf-model is normally designed to stay put after it's made—you see only the top and sides anyhow. If said purists object too strongly, we can say that there are enough pieces left over to make a balsa bottom if they insist!

The 1/16" balsa wing is scored but not cut through at the center as an aid in attaining correct dihedral. This scoring should be a real help to the less proficient builders, especially on such ships as the Vought Corsair with its inverted center dihedral. The thickened center section on the Banshee is achieved by cementing shaped pieces of 7/32" wood over the 1/16" wing. Various little bits and pieces of balsa and paper (all die-cut or marked out on the plan) serve to build up the jet outlets, wheel covers, wing fillets, and so on.

Tail surfaces of 1/16" balsa are installed next. As in all model construction work, it is wise to sand wing and tail surfaces to the desired cross-section before assembly—it's much easier then. On the Banshee, the widened center portion of the wing should not be sanded before assembly, though; wait until the thick wing blocks are added, and do the job all at one time.

Fuselage detail includes a printed instrument panel and pilot that are cut from the plan and cemented in place. Over all goes the neat plastic canopy.

Our kit includes a pair of turned hardwood wheels that are to be cemented in place under the wing. They won't turn, but with a little extra work a couple of pins can be adapted as axles, since the wheels are accurately center-drilled. On those ships of the series requiring tricycle gear, a solid nose wheel is indicated. Here again, though, there is plenty of scrap for a revolving wheel, if you insist on it; in almost all cases the piece of 7/32" wood already die-cut for the cockpit opening can be trimmed down for a nose wheel.

Finishing, of course, is up to each builder, and here is where you can make or break the final appearance of a shelf model. For a really *good* finish you must start with at least one coat of balsa sealer, and preferably two coats. After sealing, you can apply any color you wish, either by means of colored dope or ordinary paint. Each of the plans includes squadron numerals, star insignia, and similar details to be colored, then cut out. However, decals are also furnished to make the finishing job easier and neater.

Now that our Banshee is completed, let's look over the other models in Guillow's 25c line. Most of the planes have a completed wingspan of 9" to 10"; the jets with their stubby wings span about 7", but fuselages average the same length as on the prop-driven types. The two multi-motored model kits do not include the formed canopy—none is needed—but they have four plastic disks to represent whirling propellers.

Every kit includes a highly detailed 11" x 17" sheet of plans, carrying a scale side view of the finished model, plus an exploded assembly view and numerous detail sketches. The general building instructions are practically identical on every plane, and are based on assembly of the P-47 Thunderbolt. This is possible since, as mentioned previously, construction principles are as near alike for each plane as individual features allow.

Even so, the "T-bolt" instructions are

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(AT-4-51)

altered as necessary to fit the particular plane in question, and because of the large number of supplementary notes and drawings, even the uninitiated builder should have no trouble, if he'll just study the plan and all the parts before he starts to smear the glue.

In the old days solid kits contained little more than a chunk of balsa for the fuselage, and a sheet of thin balsa—sometimes printed, sometimes not—for making the other parts. Guillow's method of built-up construction for solids, or as this pioneer has always called them, "shelf models," is certainly an educational advance. True, it takes longer to build a model this way, but the builder gains worthwhile skill in cutting, shaping, and fitting small pieces. After finishing a few of these "built-up solids" he should be able to tackle a simple flying model with real assurance of success.

Though Guillow has branched out in the last year or two, and now markets a wide range of rubber and gas-powered planes for free flight and U-Control, we note with satisfaction that this line of scale model kits from the 5c baby on up is being maintained and even expanded. Here's one manufacturer—more power to him—who doesn't intend to let scale modeling languish.

Air Navy

(*Continued from page 25*)

that flies several thousand miles must carry so much fuel that it has little room for cargo. But a ship may sail with a full hold.

Because these fundamental conditions cannot change within present prediction, the Navy has a tremendous job during the present emergency and will continue to offer careers to fit and able young Americans.

The Navy and Korea

The fast carrier task force remains the Navy's most powerful striking weapon. Its aircraft screen against enemy aircraft while destroyers and helicopters are on guard against submarine attack.

In Korea, enemy air operations have been small and submarines have not been active. But the fleet is always ready.

Korean experience has proved once again that a fast carrier task force can provide support by planes and by the guns of ships for landings on enemy coasts, as at Inchon. It can also assure orderly withdrawal.

With the Navy on the job, there can be no Dunkerque. Our beachhead can be protected by a perimeter of fire into which the enemy cannot penetrate.

In the present all-out mobilization, Naval Aviation once more is expanding. Heavier carriers are being put into commission. The most modern planes and missiles are being produced. A large helicopter program is under way, for antisubmarine work and many other uses.

Win Your Wings

To become a Naval or Marine Corps Aviator, a young man between 18 and 25 with at least 2 years of college may apply for the Naval Aviation Cadet program for 18 months of intensive training. On completion, he wins the Navy wings and is commissioned as an ensign in the Naval Reserve or 2nd Lieutenant in the U. S. Marine Corps Reserve. After 18 months' actual service, he is eligible for transfer to the Regular Navy or Marine Corps.

After basic training at Pensacola, a cadet is advanced to fighter planes and is trained to land on a carrier deck first by practice landings on a small area marked on an airfield. On learning this, he has the thrill of his first landing on a carrier at sea.

Aviators may specialize. Some choose jet fighters and make their transition from piston-powered aircraft. Some go

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for the transports or patrol planes, including the big flying boats. Others may become helicopter pilots and still others may prefer lighter-than-air training, to fly the blimps for offshore patrol.

Naval commissions may also be obtained by attendance at the U.S. Naval Academy or in the Naval Reserve Officers Training Corps; by direct commissioning of civilians who have special skills; and by promotion from the ranks.

As a gauge of opportunity, note well that almost half of the present officers in the Regular Navy have had previous enlisted experience. By enlistment in the Navy, it is possible to develop one or more of a wide variety of skills.

Navy Career Plan

For a Naval Recruit, there are 7 apprenticeships: Seaman, Fireman, Construction Man, Airman, Hospitalman, Dentalman, and Stewardsman. There are 12 occupational groups all told, including 6 for Seamen. These groups are subdivided into 62 major career fields or ratings.

In these, there are no less than 1,100 separate Navy job specialties. Some 4,000 related civilian jobs are indexed as a guide to placing civilian specialists where they best fit, when they enter the Navy.

It works both ways. Navy-trained specialists who leave the service are in great demand for private industry. In peacetime, it is a problem for the Navy to replace its experts who go to highly paid jobs when their enlistments expire. Those who stay in, however, can advance to Warrant Officer or Officer grades and earn more than $500 per month, with allowances and many advantages.

The Navy urges young people to get as much schooling as possible before they enlist. Recruits with at least a high school diploma are preferred. This is required for Waves. But for men, there is no set educational requirement. Citizens of 17 and over who meet the physical and mental standards may join and be trained in service.

Air Career Fields

An Airman Recruit climbs the first rungs of the promotion ladder to Airman Apprentice and full-fledged Airman. Of the 62 career fields in the Navy, 13 are in the Aviation Group, as follows:

Aviation Machinist's Mate. He keeps aircraft engines and other mechanical equipment in perfect working order.

Aviation Electronics Technician. It takes skill to install and maintain the radio, loran, radar and other devices, for navigation and warning. Experts in this field are in great demand both in the services and in civilian jobs.

Aviation Electronicsman. On long over-water flights, this aircrew member operates radio and electronic navigation devices.

Aviation Ordnanceman. The care of bombs, guns, torpedoes and rockets on Navy planes requires another type of skill.

Air Controlman. He directs traffic, for safe take-off and landing of Navy planes.

Aviation Boatswain's Mate. He handles the planes prior to take-off and after landing.

Aviation Electrician's Mate. In every plane is a maze of electrical mechanisms and wires. All must be kept operating for safe flight and for the performance of the plane's missions.

Aviation Structural Mechanic. While the Machinist's Mate is responsible for the engines, the structural specialist maintains and repairs the wings, fuselage, control surfaces, landing gear, and other parts and mechanisms.

Parachute Rigger. This job is for packing and maintenance in perfect condition not only of parachutes but of life rafts, life belts, and survival packets.

Aerographer's Mate. That's what the Navy calls its weathermen, on whose accurate predictions safe flight depends.

Photographer's Mate. The aerial photos which he takes are the modern means of getting quick intelligence of the enemy's shore installations and fleet movements.

Tradevman. The training device man maintains flight simulators, such as Link trainers and gunnery turret trainers, whereby Naval personnel learn to fly on the ground and to shoot without bullets. Some of these devices are highly complex. For example, the pilots and crew of a flying boat can "sweat out" a simulated bad weather flight in which they will face as many realistic emergencies as might be encountered in months of flying. When the real thing comes, they will know what to do.

Aviation Storekeeper. If an airplane part needs replacing, a spare must be had immediately or the plane is grounded. The many specialized parts, equipment and supplies require trained personnel for handling and recording.

In each of the foregoing 13 aviation career fields, the operation of an aircraft carrier or Naval air station will require a number of job specialties.

Related Civilian Jobs

Any one of hundreds of civilian jobs may develop skills directly applicable to Naval Aviation and, conversely, the Navy's veteran "graduates" are found in all manner of civilian enterprises.

An Aviation Machinist's Mate may become, at an aircraft plant or civil airfield, an airplane inspector, A&E mechanic, airport serviceman, carburetor man, or propeller inspector.

An Aviation Electronics Technician may find plenty of work as an electrical or radio repairman, radio electrician, or radio mechanic. An Aerographer's Mate may become a meteorologist; an Aviation Storekeeper, an inventory clerk or expediter.

Women in the Navy are eligible for all appropriate ratings. In aviation, the Navy considers it highly desirable to utilize them in the following: Aerographer's Mate, Air Controlman, Aviation Electronicsman, Aviation Electronics Technician, Aviation Storekeeper, and Parachute Rigger.

In addition, many women on other types of duties may be assigned to Naval Air Stations.

For full details, read the U. S. Navy Occupational Handbook. You can see it at any school, college, state employment office, or Navy Recruiting Office.

The Navy offers good pay, every chance for advancement, the finest food, education, travel, and adventure. Young men and young women: complete your civilian schooling if possible . . . and look to the Navy for your career.

(Continued on page 82)

R-C Round-Up

(Continued from page 51)

used in competition. Walter had developed a single tube super-regenerative receiver using a type 30 tube—a battery-operated triode—in 1937, and this was later produced commercially. In 1939, the type 30 tube was replaced by the RK-42, a triode of the same type, which had a more economical filament.

This same year several other builders, among them 2nd place winner Joe Raspante, gave convincing demonstrations that R-C model flying had really grown up. There were eleven entrants.

In 1940 the Nationals moved to Chicago, and the Good brothers again topped all comers with a very convincing demonstration, using exactly the same plane and radio equipment they had employed in 1939. Their task was made more difficult by the fact that their transmitter was stolen the day before the radio event, forcing them to toil through the night at a Chicago radio laboratory to build the transmitter

that was to put them in first place again the next day.

Also, this same year another contestant, C. H. Siegfried, now well-known in R-C circles, placed high. "Siggie" took second with a large monoplane carrying a complex-sequence-selection control system which he operated by means of a telephone dial at the transmitter. Only a single radio channel was used, but the control unit in the phone enabled high-speed selective operation of rudder, elevator, motor speed and motor cut-off; moreover, right or left movement in any desired degree could be had.

In 1940 there were again about a dozen entrants in the National Meet, and almost all of them flew and collected at least some points.

The last prewar Nats was the 14th in 1941, still in Chicago, and at this meet a newcomer took over first place, using a control system not seen previously. Jim Walker, though well-known for his work in U-Control, topped the field of 26 entries, flying a very attractive 7-foot-span tricycle-gear monoplane, a rather small size in relation to radio planes normally flown up to that time. Walker's control utilized an ingenious fluid clutch, driven by a motor that was directly controlled by the receiver, and the result was what is termed proportional control. In other words, the rudder surface could be made to follow exactly the movement of a control at the transmitter. The rudder would move either right or left at any instant, and to any degree selected by the operator as he moved the ground control stick.

Though better means have since been found to do the same job, the elements of Walker's 1941 system are shown in Fig. 9. If the electric motor were operated at medium speed, the fluid clutch would tend to rotate the control arm toward the right, and spring tension would be adjusted just to counteract this, thereby holding the arm in the center, or neutral position. If motor speed were decreased, the spring action would predominate, thus giving left rudder; increased motor speed would produce various degrees of right rudder.

Control of the motor speed was a tricky proposition, but Walker had the system balanced to perfection, and made some fine flights, while demonstrating beautiful control in taxiing on the ground. A second radio channel was utilized to operate a two-speed timer on the motor.

Several other flyers with complex controls appeared at the 1941 meet, including Siegfried with his rotary selector system. A group of modelers from Purdue University brought a 12-foot-span ship which carried a 14-tube superheterodyne receiver! Audio-selection made possible the use of five control movements, but the ship was kept grounded by windy weather.

The war years saw great strides in radio control, though not in the model field, since R-C flying by civilians was banned. Many thousands of radio-controlled target planes (Fig. 1) were used by the Armed Services as an aid in gunnery practice. They included the OQ series, no larger than some of the planes flown at the Nationals (and, in fact, originally developed from civilian R-C model planes by Reginald Denny, the movie actor, who had a great interest in model aviation—remember the Dennymite engine?), and larger jobs all the way up to radio-controlled B-17's used as gigantic guided missiles.

The first postwar Nats at Wichita in 1946 saw a rather small gathering of

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F-86 "SABRE-JET"
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LOCKHEED
F-80 "SHOOTING STAR"
WINGSPAN 12⅜" — LENGTH 11"

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contestants who were somewhat hampered by freakish weather conditions. However, the radio boys put on a good event, and, in fact, outshone a group of Service men who were on hand to demonstrate the Army target planes. Jim Walker again came out on top, nosing out veteran R-C contestant Siegfried who was second.

Walker flew a neat semi-scale ship, equipped with tricycle gear and illustrated in Fig. 2. He had improved his proportional control system a great deal since winning with it in 1941; two radio channels were used, ending up in RK-61 receivers in the plane. Full control of elevator and rudder was available, but Jim usually flew with proportional rudder and motor speed controls (the latter accomplished with a two-speed timer) and obtained very fine results from this combination.

In 1947 at Minneapolis, the Good brothers returned to active Nationals competition, as did Chet Lanzo. The Goods won handily this time, as one after the other of the veterans, including Siegfried, Lanzo, and Walker, suffered various mishaps. The latter was ahead in points up to the last day, but then had a disastrous crack-up which could not be repaired in time to finish the meet. The Goods were still flying old reliable *Guff* but had only a single receiver in their plane. All the radio equipment they used was of commercial manufacture built from their own designs. They had a new gimmick, a thermal motor cut-off, that enabled them to stop the motor at any chosen time.

Some new faces appeared at this meet, notably a group of modelers from Indianapolis, who, though they were attending the meet "just for experience,"

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still managed to take third place. These flyers, Joe Hughes, Vic Brown, and Gene Foxworthy, have done very well since; Foxworthy was third at the 1948 Nats, and won that event in 1950 (Fig. 6).

With the move to Olathe in 1948, a real top grade radio event was seen. Fourteen entrants actually made official flights, though many more were on hand. Both winners Jim Walker and runner-up George Trammel put on breath-taking exhibitions which included consecutive loops and other complex maneuvers made possible by the fact that both had full rudder and elevator control. Walker flew a new ship of shoulder-wing design (Fig. 5), and incorporating what might be called a pulse-selection system. Only a single radio channel was required, the receiver being connected to an ingenious selector unit driven by a small electric motor. Practically instantaneous selection of rudder and elevator movement in several degrees could be had; motor speed control was also included.

Second place winner Trammel flew with what should be termed the "poor man's proportional control." In place of the complex motor-drive units employed in the past by Walker and others to operate the control surfaces, George had developed very simple and lightweight "actuators." He had these fitted to rudder and elevators, and by use of dual-channel radio equipment could really make his plane perform.

The R-C Event in 1949 at the 18th Nats in Olathe was notable for the fact that Walt Good at last entered a new design in the competition! His *Rudder Bug*, with which he took first place, was a big success, and as seen in Fig. 7 is a very attractive design, with many features intended expressly for R-C flying. As usual, Good used rudder only, escapement-actuated, but he flew with the same smoothness and sure touch that had enabled him to do so well with *Guff* in the past. A new note was added, in that he used what is now generally called a "Beep-Box"—a motor-driven transmitter control box which "remembers" the proper sequence for operation of the escapement.

Second-place winner was Paul Johnson, who had flown in his first Nats the year before. Paul used a sort of semi-proportional control which gave him instant left, neutral, or right, with no sequence involved, though there were no intermediate positions available.

Bringing us right up to date, the 19th Nationals at Dallas had the biggest radio event ever—about 40 entrants! This meet saw the first use of equipment in the so-called "Citizens Band," which equipment can be operated legally by anyone without the need for possessing an Amateur license. Gene Foxworthy used the 465 mc. equipment in his ship, with escapement operation of rudder only, to win the event. In addition to 465 mc., and the 50 mc. Amateur Band used by most of the other entrants, an experimental 27 mc. transmitter licensed to the A. M. A. was in operation. Several flyers tried it out, and Jim Schenck, using this transmitter and a Beep-Box, took second place; he flew a *Rudder Bug* with escapement-operated rudder. 1950 saw the first flying of the Navy-sponsored Radio Control Bomb Dropping event, won by Schenck.

This brief coverage of the Radio Control Events at the Nationals will serve as a progress outline of model plane R-C work in this country. Though we have covered only the Nationals, there have been R-C events at hundreds of

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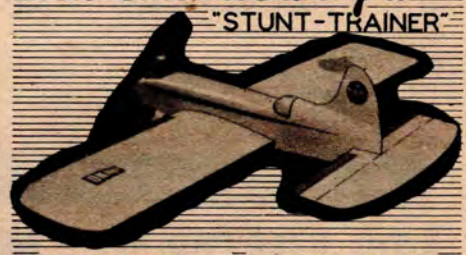
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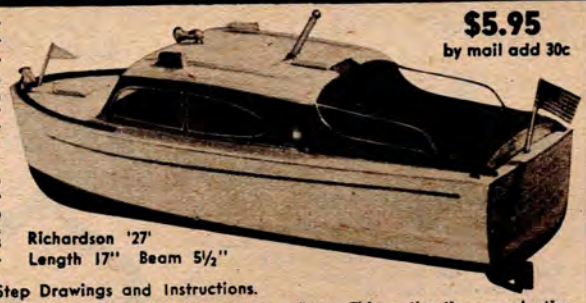
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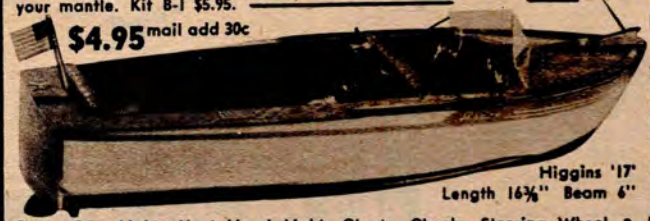


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other meets since 1946. On the East Coast, the huge Flying Fairs put on by the New York Daily Mirror have always featured the Radio Event, and in the West such meets as the All-Western Open serve to keep the radio boys in practice. Between the two coasts, the interest has been just as great, with especially active groups in Chicago, Pittsburgh, Kansas City, and elsewhere.

Subsequent articles will include details of all commercial R-C equipment available today, homemade equipment, actuating units, engine speed control, and the like. Study them carefully and we are sure you'll want to engage in this fascinating activity.

Our Expanding Air Force

(*Continued from page 21*)

gives support to the ground forces, and has inaugurated, with the Army, an intensive course of cross training. In Korea today tactical air power is proving invaluable to the success of the ground troops. It will be essential to victory in any war in which surface forces become engaged.

The Air Defense Command is responsible for the air defense of the United States. It operates the radar Aircraft Control and Warning System and employs the interceptor aircraft that will engage and seek to destroy approaching enemy aircraft detected by this radar net.

Air Materiel Command is in charge of Air Force purchasing, including the aircraft which always must surpass the best of other nations.

Air Training Command conducts training of flying officers and of airmen in all the many specialties required by the Air Force. *The Air University* is in charge of the advanced military education of Air Force officers.

Military Air Transport Service, operated jointly with the Navy, is like a scheduled airline for the whole military establishment, flying personnel and urgent cargo across the world. MATS operates its own communications, weather, and rescue services.

Overseas Commands are maintained in the Far East, Europe, Alaska, and the Caribbean for occupational duties or purposes of defense.

Aviation Cadets

Single male citizens between 20 and 26½ years old may apply for Air Force pilot training. They must agree to remain single through the year of flight and ground courses. At least 2 years at college (60 semester hours or 90 quarter hours) are required plus the passing of mental, physical, moral, and personal examinations.

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The job of navigator is another flying opportunity. Selections are on about the same basis as for pilots except that eyesight and hearing requirements are less exacting.

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(Other routes toward a commission may be through the Air Force Reserve, Air National Guard, or Air ROTC, as told under "Reserves" in this issue.)

Career Plan

Since every flyer must be backed by a dozen or more men on the ground—in maintenance, supply, and dozens of other services—don't be discouraged if there doesn't happen to be room for you in the cockpit. The Airman career program is carefully planned to enter recruits in the fields for which they show aptitude. There's a place for you.

In every specialized field, an Airman has alternate paths of advancement, through the enlisted grades to Warrant Officer, and on to commissioned rank.

New Airmen go to Lackland Air Force Base near San Antonio, Texas or to Sampson AFB, Geneva, N. Y., the basic Airman indoctrination centers. All enlistments are for 4, 5, or 6 years.

As this is written, the Air Force has not been drawing men by Selective Service but has met its requirements through volunteers and through its Reserve components.

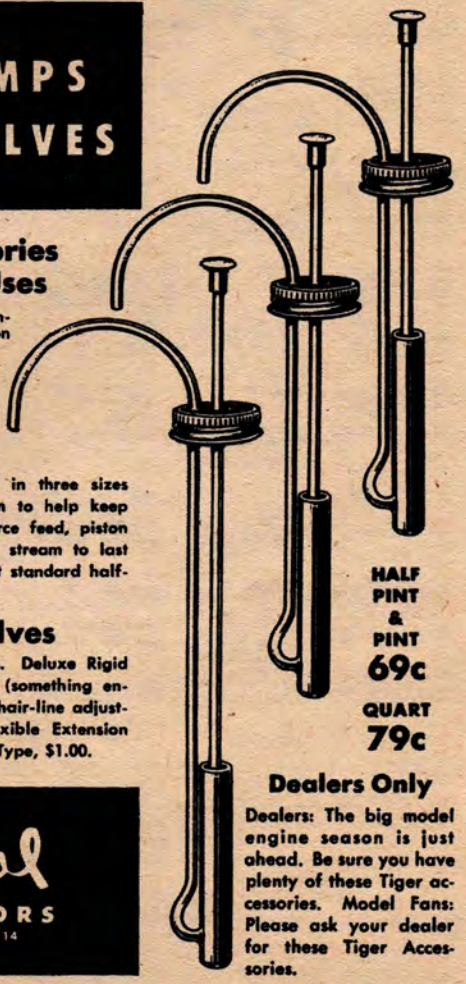
From all young men and women, willing and able to do their part in America's great preparedness effort, the Air Force invites inquiries. Call at the nearest Army Air Force recruiting office. Talk to air veterans and Reservists in your home community.

If the Air Force is your choice, then it is simply a matter of deciding whether you wish to enlist in the Regular service now, apply for cadet or O.C.S. training, or avail yourself of opportunities in the U. S. Air Force Reserve, Air ROTC or Air National Guard.

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Soloed at 12!

(*Continued from page 40*)

airplane. After the student flew for about 15 minutes Red took over, came down and landed. They had been up about 30 minutes. There is nothing unusual about this first lesson of a new student, except that I, Stephen Hoadley, the new student, was only 10 years old at the time.

It was late in September, so I got but one more lesson that year before Red left for Miami, Florida, in December, 1948, as an aerobatic pilot in the All American Miami Air Maneuvers.

There was a period in which I didn't do any flying, but I learned what I could by watching airplanes and pilots and reading air magazines.

It was almost a year later when I started my flying again. During the month of September, 1949, I got in a total of three hours. Another instructor had taken me over. In those three hours I learned the basic maneuvers of flying, such as turns, stalls, climbs, and glides. I also learned the traffic pattern, forced landings, and take-offs and landings. I almost memorized the CAA "patter" book.

All of this flying wasn't easy, and it took time to master it. Like everyone, I made discouraging mistakes. As an example, my take-off. On my final turn for take-off I would swing around too far to the left. I would push left rudder and swing around, but too far! A work-out of rudder pedals followed, making my take-off a beautiful zig-zag. There were other things, such as my glides, almost stalling, my turns skidding, and other defects.

It was May, 1950 before I flew again. With an instructor, I reviewed my airwork and then settled down to practice take-offs and landings. I flew four hours of take-offs and landings in the month of May. My father took over on the 31st to work with me.

The next day was the first of June, and partly cloudy. That afternoon my father and I went up. I did most of the flying. I made about four take-offs and landings. As we taxied up for the fifth take-off my father said something to this effect, "Now Stephen, remember, don't ever become scared or excited in an airplane. It won't help. Just be calm and use your head in case of emergency."

When we were ready for the fifth take-off, he shouted, "Everything all right? Now you try it by yourself." With that he opened the door and got out.

At first I was rather frightened, but I quickly calmed myself and took off. In the excitement it was hard to think of little else but flying. I was trying to make my turns as precise as possible, and cut the throttle at just the right time, being sure that my carburetor heat was on, to hold my glide just a little over 60 mph, and make my landings perfect three pointers. My first landing was a good one. Was I happy!

I noticed some of the airport's pilots were grouped around an airplane in front of the hangar. A few of them glanced casually up as I turned around. In the air again I wondered if my solo would raise much excitement, if I would get my name in the Bloomington paper, and how my mother, who didn't know I was soloing, would take it.

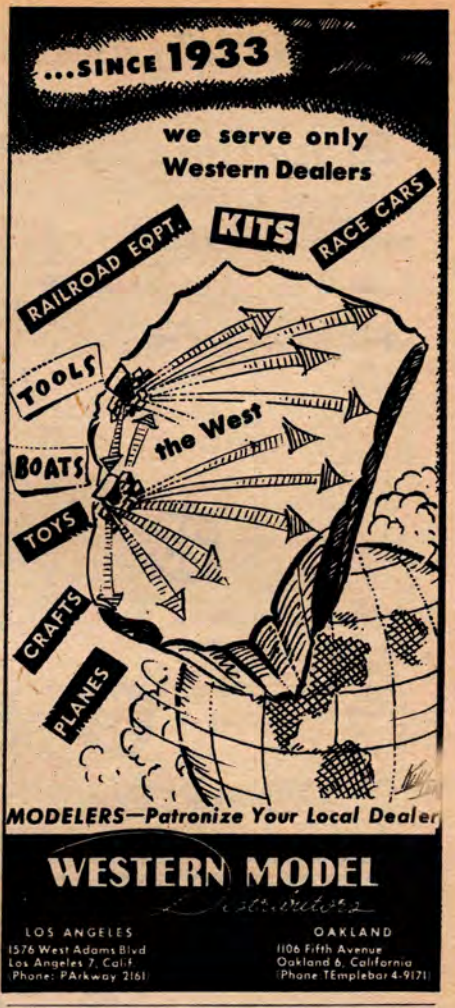
I felt light-hearted and gay about soloing at 12 years old as I finished my three landings and taxied over to the hangar and turned off the switch. Dad told me I was the youngest solo pilot in the world. It had taken 9 hours and 20 minutes over a period of three years.

As is the custom at Veterans Airport, my shirt tail was cut off and my name and the date of my solo were written on it. It was then tacked on the bulletin board in the office. I also had to pass out "Cokes" to everyone at the airport.

A few days before solo, I had gone to my doctor's office for my medical exam. He wasn't the kind of person who loves flying and was rather shocked to find that even children were turning to flying. While he was filling out my CAA blue sheet pertaining to my mental condition he said something that I will never forget. He said, "There's nothing wrong with your mind, is there, except that you want to fly?"

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Civilian Employ

(*Continued from page 33*)

opportunities for aviation work in government are with the Civil Aeronautics Administration. Its duties include supervising flight operations on the Federal airways, inspecting aircraft and pilots, supervising airports, and transmitting weather and traffic information to pilots.

Many CAA men are Air Force Reserve Officers who may go on active military duty, though plans to make CAA a military unit to keep its people have been considered. In any event, vacancies will occur. For some technical jobs, CAA gives the training at full pay and subsistence.

Jobs such as control tower operators, communicators who talk to pilots aloft over the radio, and traffic control personnel are performed by CAA people at airports throughout the United States and Territories. Alaska, for example, offers placement to adventurous people ready for new frontiers.

Outside of CAA, more than 5,000 civil airports give local jobs such as flight instructor, A&E mechanic, and charter pilot. Because of the importance both of the airlines and of the non-carrier lightplane fleet to civilian defense, it is expected that a large volume of flying activity will continue through the emergency.

The flight schools are seeking an airman training program for civil pilots and mechanics as a war reserve. This, together with civil defense flying, may create many jobs for instructors and maintenance personnel.

Further emergency, moreover, will call for more people to guard airports and maintain close control over all flights.

Growth of civil aviation after the emergency seems assured both in air transport and in popular flying, as better and faster planes are developed. Roadable lightplanes and other innovations, indeed, may bring the rapid growth which air enthusiasts have hoped for.

Those who are alert to the possibilities may win permanent places in aviation.

Young People

(*Continued from page 30*)

Sources of recruiting information, both for Regular and Reserve forces, are the Air Force and Army recruiting offices which are combined, and the Navy and Marine recruiting offices which are separate, though they may be housed together.

Ask your High School library to keep a current file of recruiting literature. Read it. Think about it. Talk to men in the service. Ask them the questions that aren't in the books.

For Your Guidance

It is one thing to want a career and another, of course, to be fitted for it. If you are "all thumbs" when you try to use tools, for example, it probably wouldn't be smart for you to become apprentice to a watchmaker.

Aviation requires such a broad variety of skills that if you don't qualify for one, you may nonetheless be good in another. But be sure which to develop.

Vocational guidance advice is available in modern high schools. To veterans, it may be had from the counseling service of the Veterans Administration.

The U. S. Employment Service has developed aptitude tests which are given by the public employment services of the states. By psychological devices such as boards into which pegs are fitted, and diagrams to be completed in pencil, some judgment as to skills may be gained.

A girl, for example, shows dextrous





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fingers but is slow on words. So she is advised to run bookkeeping machines rather than become a stenographer.

Such tests are not always conclusive. But it is wise to try to find what you can do best rather than spend years of training for something not for you.

For the services, the U. S. Navy Occupational Handbook has been issued as a manual for civilian guidance counselors and Navy classification officers. It describes, in pictures and words, the duties of many types of specialists; the comparable civilian jobs; and the training subjects required.

Similar handbooks for Army and Air Force are in preparation. Civil Service information also is available through your nearest Post Office, or public employment office. To guide you to your place in aviation, there's a world of material for the asking.

Air Reserves

(*Continued from page* 29)

depends on your proximity to a Guard armory of hangar. Make local inquiries.

For Students

The Reserve Officers Training Corps offers, in many colleges, the chance to take college-credit courses in military science and tactics; attend drills; and graduate as a 2nd Lieutenant.

The Air ROTC program is extending to an increasing number of institutions. Legislation is proposed to give flight training at civil airfields to these students. The Navy still has college programs for a limited number. West Point is the Army's college for officer candidates; Annapolis is the Navy's. The Air Force as yet has no academy of its own.

Also pending is an Airman Training bill for an extensive program of civilian pilot and mechanic training under auspices of the Civil Aeronautics Administration but for military preparedness.

Veterans still have the privilege of flight, mechanics, electronics, and other career courses under the G.I. law, if they lose no time in applying at the nearest Veterans' Administration office.

In the several Reserves, study opportunities are provided through local volunteer units where evening classes are held, and through a great variety of correspondence courses. Young men who want to enter the service of their choice as non-coms or officers, rather than be drafted as privates without choice, will be wise to avail themselves of the chance to prepare.

As the deal will be fast changing, the only way to keep informed is to check with your nearest Army Air Force, Navy, Marine, or Guard recruiting office.

Volunteer Units

Another way to gain experience is to join a local unit of the Civil Air Patrol, an auxiliary of the U. S. Air Force. (See notes under "Civil Defense.")

The Air Explorers, of the Boy Scouts, also are given aid by the Air Force, including summer camp attendance at bases.

Look them all over; take your pick; and join while you can.

Cargo Clipper

(*Continued from page* 45)

Flight characteristics of the 35% C. G. model will give shallow dives or stalls with quick recovery. So that if the model does stall or dive to the ground, the shock will be small when compared to the large looping or dives of the 75% C. G. model.

The 35% C. G. has one drawback. This is its tendency to stall if the power is too great for the design. But since we definitely try to load the Cargo Clipper as much as possible, this is of minor importance. It does,

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however, mean that *the model should be tested with almost full "payload."* Otherwise, stalls or loops may occur although the glide may be perfect. This point can be used for determining the maximum possible load.

With the model adjusted to glide well, any looping or stalling tendencies during the power flight can be corrected by adding extra weight over the C. G. until smooth and gradual climb is achieved. (Note: Mushing tendency was corrected by adding weight over the C. G., and not by adding weight in the front as for normal practice.)

Although one might think that high thrust line would have diving tendencies, the actual conditions do not seem to bear this out. It is possible that the stabilizer on its long moment arm handles this particular situation well.

Another design consideration was the desire to have the model fly straight into the wind and without banking to preserve full wing lift.

In selecting a high thrust line for the Cargo Clipper design for reasons given, the structural design presented the usual problem of low wing mounting. By using a platform that conforms to the top curve of the rib, a surprisingly steady wing position was achieved. To provide the necessary hard landing shock-absorbing essentials, the wing is held on with rubber bands. Note the wide spacing of these rubber bands to provide "rigidity."

To provide still more shock-absorbing potentials, the nose is hinged as shown, and held in closed position with rubber. So that whenever the model makes a hard nose landing, the front portion will swing open under tension and so absorb the shock.

To carry the cargo, the front portion of the model has "tunnel"-like structure. The preferred method of handling the cargo is to make a balsa block to fit the particular "tunnel." Then drill as many holes as possible in which lead or other heavy metal can be carried. Besides making it a convenient way to give full load to the officials for weighing, the weights can also be shifted to provide flying balance . . . Construction details, for those interested, may be found on the full-size plans of this model available.

"AT" Interceptor

(*Continued from page 37*)

wing tips with lead weight on right-hand panel only and sand the complete assembly.

Fuel line can now be installed in the wings if a pressure tank installation is being built. Cut a groove into top of the leading edge to take the 3/32" brass fuel line. Fit brass tube into place with ends bent upward in fuselage and boom so rubber tubing can be slid on the ends later. Cover tubing with 3/32" sheet balsa and sand smooth. Any dirt that enters fuel line or paint at the ends will clog regulator later on, so protect these ends with a short piece of rubber tubing plugged with a small machine screw. This completes wing assembly and we are ready to start fuselage. (Additional construction details for those interested, may be found on the full-size plans available.)

Women's Work

(*Continued from page 31*)

enlisted personnel—barely more than a token force. In the event of full mobilization, a goal of 10% is possible. It could be larger.

The Air Force part of the 3½ million planned strength as of June 30 for all the services is approximately a mil-

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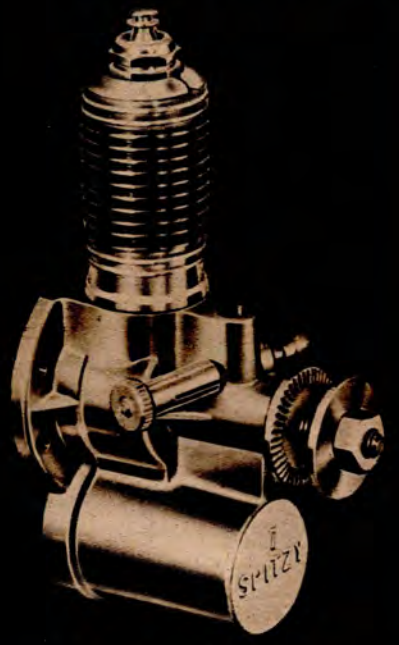
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lion, so the WAF complement could be in the magnitude of 100,000 when the bars begin to go down. And the Air Force will continue to grow far beyond its June 30 strength.

While official figures have not been revealed for the other women's services, there is no direction to go but up.

Enlistment ages for women, in Regular or Reserves, are about the same as for men—from 18 to the mid-30's. Older women who have exceptionally valuable experience may be admitted later.

Duties for many of the girls in uniform will be much as they were during the last war. But the Air Force offers a wide variety of specialties—from flight dispatching to aircraft engine overhaul—in strickly aviation jobs.

Air Adventurers

(*Continued from page* 41)

for years and are still very popular today; they range from the unbelievably light and fragile indoor models (weighing a tenth as much as the model we will build) to large and powerful fuselage-type contest designs that climb and fly like gas-engined jobs.

The model shown herewith has been designed ruggedly enough to take a lot of beating without breakage. It could have been made much lighter, but then you would probably have to spend as much time making repairs as flying, and the flying qualities wouldn't be enough better to compensate.

As was the case with last month's all-balsa glider, our present powered job incorporates only the elements needed to make a flyable airplane. The basic construction member is the fuselage stick, with vertical and horizontal tail surfaces at the rear, and a wing near the center. (With the wing in the proper location, this much of the model makes a very nice glider—try it.) The power elements are the propeller and its bearing (often called a prop hanger), the rubber motor and the tail hook.

Let's build it and see what it can do. Transfer the wing outline to a flat surface—a sheet of Celotex or other smooth-surface soft wallboard is ideal—marking the location of all ribs. Do the same for the horizontal tail surface. Lay a sheet of waxed paper over the board, then start cutting the various spars and ribs to size.

Pin them down over the pencil lines, but *do not push the pins through the wood;* rather, place pins on either side of the strips to avoid splitting them. It is only necessary to pin down the leading and trailing edges of the surfaces—the ribs and tips should be cut long enough to hold themselves in place with very light pressure.

When all parts are cut and fitted to your satisfaction, cement them in place. Put a *small* amount of adhesive on both ends of each rib and on the spars where it fits, then quickly press in place and align properly. The center joints of the wing spars should not be cemented at this time, nor should the center rib be installed; however, the horizontal tail (usually called stabilizer, or just stab for short) should be fully cemented.

While the wing joints are drying, you can assemble the motor stick. Following our rugged construction policy, this is made as a T-beam from two pieces of ¼" x ⅛" strip. Cut these to size (note that they differ in length), apply cement to one edge of the vertical member and press together. If you are using the specified fast-drying grade of cement, you'll have to hold them only a few moments until the cement sets.

The prop hanger is made of a strip of tin can metal ¼" wide and about 3" long. Flatten it out, then bend it double. One eighth inch from the fold, puncture a hole with the point of a small nail. Pound the nail lightly until the tip just goes through—you don't want

a big hole. Then bend as shown and bind to the motor stick with thread. Coat well with cement.

The tail hook can be made from .035" music wire, though a T-head pin also works nicely. Force the pin carefully through with a twisting motion so you won't split the wood. Bend as shown and cement well.

Now, back to the wings. Remove the tail frame from the building board and cement it in place on the motor stick. Assemble the rudder, which has the same shape as one-half of the stab, and cement it together over the wax paper.

The two separate wing halves may now be lifted off the paper; raise each wing tip 1¼" from the board, apply cement to the inner spar ends, and install the center rib. Don't forget the ⅜" x ¼" x ⅛" block over the rear spart joint; this will hold the wing at the proper incidence angle.

The wings are covered with tissue paper on the top only; cover only one side of the rudder. Before covering, go over all glue joints with sandpaper to remove any little lumps or points that would make covering difficult. If you want to make a neater job, you can round off all the outer edges and tips of the wing and tail surfaces; this doesn't add noticeably to performance, however.

The stab should be covered *before* the rudder is installed, as you can then do the whole job with a single piece of paper. Full strength dope is used for covering; cut a piece of paper roughly to size, but at least ¼" larger all around. Apply the dope liberally to one half the stab framework with a stick or small brush, then lay the paper on and smooth it out to remove all wrinkles; when the entire frame is covered, allow it to dry, then trim away excess paper with a sharp razor blade.

Cover the wing the same way, using a single piece, but start at the center and work outward, doping the frame and smoothing the paper only as far as one rib at a time.

By now you have an almost complete airplane. The only thing missing is the prop and motor. For the propeller, you have several choices. Most hobby stores carry either rough-carved balsa props, or plastic props made especially for rubber-powered models. The balsa style in 6" size was used on the finished plane pictured herewith.

Either will give good results, though the balsa one is better for this design due to its higher pitch (this means the blades are twisted to a greater angle). The balsa prop needs a little finishing; the blades should be thinned a bit and rounded at edges and tips. Also, you will have to make a hole for the shaft—a pin carefully forced through will do the job. The shafts on our test models were made to the size shown from .035" music wire.

If you cannot get either style prop mentioned above, you can easily carve one from a balsa wood blank. The plans

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show the steps. When finished, the blades should be from 1/16" to 3/32" thick except near the center or hub, where greater thickness is needed for strength.

Don't worry if your finished prop is not a beautiful job; almost any prop will propel your plane as long as the blades are twisted! Give the balsa props a couple of coats of straight dope, sanding lightly after the first coat. The plastic prop naturally doesn't require doping.

Fasten the wing under the motor stick with a rubber band, and install the propeller (don't forget that a bead or a couple of washers are needed for a bearing) and rubber motor. Slide the wing rearward until the leading edge is 4" back from the forward end of the motor stick, and try a glide or two.

The plane should be checked until you have the best possible glide—that is, as long and flat as possible, but without stalls. Now wind the propeller about 90 turns for your first power flight. If your wings are all flat and without twist, the model should make a nice circle to the left—the left turn is caused by the torque we mentioned earlier.

You can check the result of various adjustments now; try sliding the wing ½" forward or ½" back from the normal location. This movement of the wing takes the place of bending the stabilizer rear edge up and down, as you did on the gliders; you are really just shifting weight back and forth, and the same results could be had by leaving the wing at the center position and adding a small weight to nose or tail.

You can put as many as 200 turns into the rubber motor for extended flights, but, of course, with more power on the motor, torque will be greater, so make your adjustments carefully.

Building time: about 2 hours.

Material Required: one length (3 ft.) ⅛" square balsa, light to medium grade. Two lengths (3 ft.) ¼" x ⅛"

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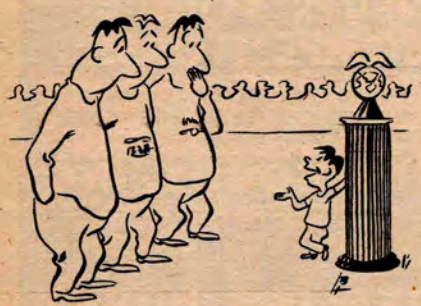
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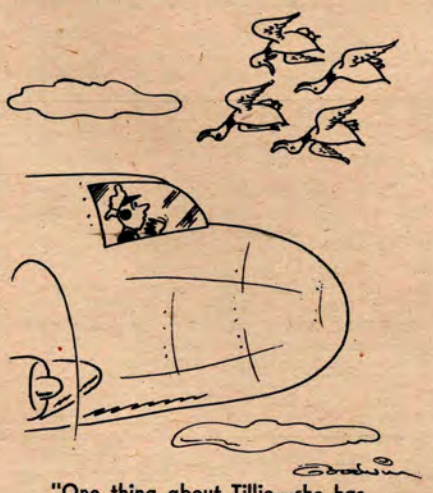
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balsa, light to medium grade. One 6" plastic, or semi-finished balsa propeller —or prop blank 6" x 1" x ½". Two feet 3/16" flat rubber. Three inches .035" music wire. Two dozen pins for assembly work (T-pins preferred). Tin can metal for prop hanger. One glass bead or several small brass washers. One small tube fast-drying model cement. Twelve inches heavy thread to bind prop hanger. Strip of rubber model tissue 18" x 6". Rubber bands to hold wing to motor stick. Dope and thinner (1 oz. of each will do for half a dozen models).

Tools Needed: razor blade (single-edge type) or modeling knife. Long-nose pliers. Pen knife for carving propeller. Soft brush 1" wide for doping. Sheet of wax paper 18" x 12". Building board 18" x 12" or larger. Three-inch square of fine sandpaper.



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Royal Spitfire

(*Continued from page* 52)

flight ship. High power-weight ratio with very little vibration should give good performance in any free flight or radio control application.

The engine test was started using the Royal Spitfire propeller supplied in the kit. Initial speed was 13,500 rpm with no tendency to heat or slow down. After a few minutes the engine reached 14,000 rpm and seemed quite limber, but running was continued for forty minutes before starting the rpm tests. The engine ran very steady and was easy to start at all speeds, but power seemed to drop at speeds above 15,000 rpm. The *Royal Spitfire* propeller supplied with the kit is approximately a 6/3 and undoubtedly gives the best performance.

Starting was best with a small prime in the head of the engine rather than choking. The engine stood up very well at high speed (16,000 rpm) showing no sign of wear on the main bearing or any other part. Nothing unscrewed or became loose during the complete test.

When the engine was received there was a small leak at the head gasket and tightening the head produced a slight bind against the piston. A careful check showed this was caused by screwing the cylinder into the base with too much force. Finally the head was tightened while holding the cylinder, and then the cylinder screwed into the base with moderate pressure.

This eliminated the leak and left the engine quite limber. For this reason the cylinder head wrench should be used to hold the engine when changing glow plugs as indicated in the directions; otherwise pulling the plug tight may jam the cylinder into the base.

Engine Data

Performance. Weight without tank: 1.79 oz. Propellers—6/4 wood: 13,800 rpm; 6/3 wood: 14,000 rpm; Royal Spitfire: 14,100 rpm; 5½/4 plastic: 15,200 rpm; 5/3 wood: 16,300 rpm. Fuel: manufacturer recommends "Spitzy" Nitromic Glow Fuel. Fuel level test: 8" at 14,000 rpm. Engine run on built-in tank: 1½ minutes.

Design Data. Displacement: .065 cu. in. Class: A. Stroke: .437 in. Bore: .436 in. Stroke bore ratio: 1. Compression ratio head: 6.5. Compression ratio base: 1.28. Port area—intake: .019 sq. in.; bypass: .031 sq. in.; exhaust: .032 sq. in. Ignition: Spitfire glow plug.

Construction Features. Bearings—crankshaft: bronze bushing; crankpin: hardened steel; connecting rod: hardened steel. Exhaust stack new on engines below .09 displacement.

Parts Illustrated

1. Cylinder, steel, .436" bore x 31/32" long, .37 oz. 2. Cylinder head, aluminum, ¼-32" thread, .08 oz. 3. Glow plug, steel body, ¼-32" short, .13 oz. 4. Base, aluminum die casting, .53 oz. Needle valve body, brass. 5. Tank screw, steel, 4-40 N.C., .03 oz. 6. Piston, steel-hardened and lapped, .436" dia. x .375" long. Connecting rod, steel-hardened, 13/16" long, .13 oz. 7. Back cover plate, aluminum, .866" O.D., .12 oz. 8. Tank gasket, Vellumoid, .011" thick, .00 oz. 9. Needle valve, steel needle, .052" dia., .04 oz. 10. Tank, aluminum, ⅞" dia. x 11/16" long, .14 oz. 11. Mounting bolts, steel, 3-48 N.C. 12. Crankshaft, steel hardened and ground, .2335" dia., .28 oz.; drive washer, aluminum, ⅝" dia., .05 oz.; front washer, aluminum ⅝" dia., .02 oz.; prop nut, brass, 8-32 N.C., .04 oz.

Total weight with tank: 1.96 oz. Total weight without tank: 1.79 oz.

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See page 74

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Civil Defense

(*Continued from page 32*)

by state aviation officials and approved by the national civil air associations. The actual setup will vary somewhat between states.

No age limit is set for civil defense service, as now planned. So qualified young people as well as adults should be able to apply to local C.D. offices when established.

There will be information at your nearest airport about the plan. One thing required for all flying and for airport ground duties will be an identification card, prepared by Civil Aeronautics Administration and FBI, to bear picture and fingerprints. Your birth certificate or other evidence of citizenship will be required for this.

Civil Air Patrol

Civil defense workers will not be uniformed but will wear white armbands bearing the C.D. insignia on their civilian clothing.

CAP remains a uniformed, quasi-military corps. Where there is a local unit, male and female volunteers may apply for Senior membership at 18 or over, or for Cadet membership if between 15 and 17 inclusive.

Cadets may go to Air Force summer camp and may qualify for CAP officer candidate training. Those who complete the courses may enter the Air Force Reserve above the rank of private.

Training in military subjects and pre-flight aviation, together with orientation flights, is valuable preparation for military service or for civil aviation.

In addition to CAP, some states may include air units in their State Guards which, as in the last war, may be formed for home defense if the National Guard units are called to federal duty.

Spotters

Another emergency service will be the aircraft spotters, patiently watching to report every plane so the vigilant men on the interceptor board can be warned of any flight not identified.

The radar network must find any high-flying bombers that cannot be seen or heard from the ground. But radar operates by line-of-sight rays. So, as the earth curves or as hills stop the beams, aircraft at low altitudes may be undetected unless there are ground watchers on the job.

Aircraft identification—knowledge of plane types—is essential so enemy planes will be instantly recognized while needless alarms will not be sounded over innocent air traffic.

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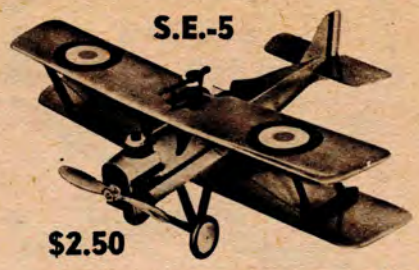
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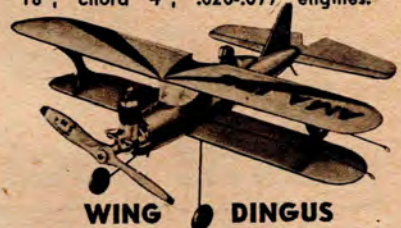
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Dope Can

(*Continued from page* 39)

(scheduled this year for June 3)—and that handicap system is considered by most folks to be a very fair and equitable one which is being followed closely as a possibility for all competitive flying.

No changes at all in free flight. 'Ray! For control line models, the Board decided ships could be flown on one control line (Stanzel's Mono-Line system) with minimum size lines as follows: Class A, .016 in. dia.; Cl. B, .018; Cl. C, .020, Cl. D, .024. The "special maneuver" judging has been discontinued in control line precision aerobatics.

One decisive change has been made in outdoor rubber flying. There the previous sizes of both stick and cabin have been combined into two: an "unlimited" category with no cross-section requirement, no size class and optional launching. The '50 requirements for wing loading, what constitutes an official flight, timing of flights, and the like are retained. The second category is for Wakefield models under the new rules—briefly, the changes are total lifting and stabilizing area, 263.5 to 294.5 sq. in.; minimum fuselage cross-section, 10 sq. inches; minimum weight, 8.113 oz.

For the "unlimited" (shall we call it "UL" flying?) class there shall be a maximum time limit per flight of 6 minutes. *Hm-m-m.*

Let's see now, what else? Towline gliders: all previous classes combined into two—Class C from 130 to 260 sq. inches; Class D, 260 sq. inches and above. Rubber powered indoor models: R.O.G. and R.O.W. classes for stick models have been eliminated. We go along with this deal—gladly. For years we've been watching a handful of chaps fly in these two classes, rise-off-water and rise-off-ground indoor stick, and usual practice has been to use one model for several events by substituting an inadequate set of floats in place of an entirely inadequate set of wheels—none of which could properly support a model.

Hand-launched gliders came in for some changes as far as outdoor flying is concerned. From now on there will be but two classes—Class A, 30 to 80 square inches; Class B, 80 to 130 square inches. No changes for the indoor glider categories.

After much deliberation the Contest Board opines that scale model plans of flying modelplanes appearing in magazines shall be allowed for use in judging, providing that such plans have been checked for accuracy by the editors.

Amen—to the rule changes. We think the Academy did a swell job, particularly its headquarters staff, the contest directors and club leaders who cooperated with the Contest Board in getting opinions from modelers for transmittal to Washington. The amount of work involved in the production of a new set of rules is astonishing.

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especially when you learn that no more than 15 years ago the official regulations were pretty much prepared by one man. And a good set of rules they were then, too. Of course, we didn't have any gasoline engines, any U-control or much in the way of performing flying scale, so the regulations were quite simple and fairly brief.

Today, all that is changed—and we like it. To the Academy and its Contest Board headed up by Harold Bunting of Greensboro, N. C., we say, "Well done!"

Aeronuts Heard From. As secretary of the "long lost" *Chicago Aeronuts* (established in 1935), Arthur Christensen (3148 Harrison) says its time we had a word or two from that congregation. The *'Nuts* have not had an abundance of publicity of late, but regardless have been active just the same. Last year this experts' club held three successful contests in the Chi area. First was the regional Wakefield qualification round, then the club's Mid-States meet, and then a season-concluding contest for good old-fashioned rubber powered jobs and gliders. The same series of meets are on the calendar for '51.

As a new twist on trophy scrounging, the *'Nuts* made many of their own in the fine furniture manufacturing plant of Gerald Ritz. You'll remember the Ritz wing still in great favor? G. R.'s the boy. He donated the use of his plant and materials, the club members donated their time and the result was some really super awards.

The *'Nuts* are always looking for new members who are active in the Chi area, says AC. He joined after seeing a notice in a '48 issue of AT; Art extends an invitation to all would-be *'Nuts* to look him up. Elections for '51 officers resulted in Peter Vacco taking over the presidency; Bill Ehrlich is v.p.; Ritz is treasurer and Carl Haas handles publicity.

"During the winter months," reports Christensen, "we are not able to do much flying because of the short-sightedness of political figures who control our armories in Chicago. Chicago used to be the hub of indoor flying but in the past 10 years the disintegration of this fine art has taken place. It is impossible to obtain use of one of our many armories because of buck-passing by politicians. Pardon if I seem perturbed, but it does aggravate me and many other would-be indoor builders.

"In winter months activity always decreases and to take up slack we have talks on theory, design and practical applications by such well-known builders as Ritz, Ehrlich, Carl Goldberg, R. G. Schmitt and Ed Lidgard. These boys really work on their talks and demonstrations to entertain and enlighten fellow members.

"You can expect to hear more from us in the future as we want our club to be known as the spark plug for the mid-western area . . . or should I say, 'glow plug'?"

Industry Notes. Ohlsson & Rice have announced the curtailment of production on their model midget racer that retailed at $5.95. Reported O&R: "The material situation has become so acute that at the moment we cannot foresee any possibility of the continued production of the car, unless the material shortage is relieved." Based on conditions in the model industry and the growing demand of defense needs, other O&R observations were:

Engines—most of their models will be supplied in limited quantity. *Fuel*—at present situation looks fairly good, reasonably sure supply will continue. *Glow Plugs*—may become critical, 75% of world's platinum comes from Russia; material is already on allocation basis by prime suppliers. *Spare Parts*—supply of replacement parts will be limited.

The general engine and accessory picture in the face of mobilization is such that AT staffers suggest all modelers take better care of their powerplants. On free flight models don't fly without a working, reliable dethermalizer; have your name and address on fuselages, wings and tail surfaces. Keep your engine clean, covered when not in use and between flights, and oiled if away on the shelf. Ditto on U-control engines. If you have any ignition engines hang on to them in case the methanes that go into g.p. fuels become hard to get.

In a word: conservation. Nobody—and we mean *nobody*—knows what the future holds. The wise modeler will take good care of what he has and refuse to get jittery about next year's powerplant.

Art Winston of America's Hobby Center, Inc., reports that outfit will celebrate its 20th anniversary in June. The company has grown "from a counter in a candy store to the largest hobby store in the country."

Gordon L. Osmon of Plainville, Ind., advises in answer to readers' queries that airplane photos of World War I ships can be purchased from "Airphotos," Box 117, Jamestown, N. Y. And M. Siehenlist of Wheat Ridge, Colo. reports that WW I *and* II photos are available from Aeroplane Photo Supply, Box 195, Toronto, Canada. The mysterious "M" Siehenlist, incidentally, says he or she is 13 and wants a pen-pal.

Vic Stanzel of Victor Stanzel & Co. (Schulenburg, Texas), the originator of "G-Line" flying and more recently Mono-Line, happily reports that the U. S. Patent Office has just allowed 22 basic claims covering the Mono-Line torsional or rotating line control system for both elevator and non-elevator type controlled model airplanes.

That coupled with the AMA okaying the use of a single line in contest flying should make Vic a very happy fellow indeed.

This new control system, writes Mr. Stanzel, "Opens an entirely new, hithertofore unexplored field in model aviation, with great future possibilities. It permits positive controllable flights, especially with the small Class Half-A and A models, regardless of wind conditions. Models may be flown on extraordinarily long control lines . . . from 40 to 100 feet in A and A/2 and on

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much longer lines in the largest Classes B, C and D, because the model remains under full control and responds to any control handle movement even if it is blown in towards the center of the circle with the line going slack.

"This is a terrific advantage, not only for sport, stunt and speed flying but also for flying scale where the inherent stability of the model may not be so good and positive foolproof control is even more important. Since sensitivity of the control is adjustable, it may be toned down for the beginner to prevent over-control while for the experienced stunt flyer it may be stepped up to permit tight, snappy maneuvering.

"In order that the model airplane industry as a whole may benefit by this new development, licenses under this rotating or torsional line control system patent, as well as other U. S. patents covering same, will be made available to reputable manufacturers who may be interested in the manufacture or sale of model aircraft, construction kits and control devices of this type.

Club Chatter. Salisbury, Md., *Ground Loopers MAC* are active and looking for members. Officers for '51 are Charles Newton, Sr., pres.; Clifford Morris, veep; William Waller, sec.-treas. Localites can contact WW at Rt. #2 . . . You've heard of the So-and-so Association of Model Engineers? Meet the "National Association of Model Engineers" of McKeesport, Pa. Quite an ambitious moniker! New officers are Edward Wisser, pres.; Ralph DeCecco, v.p.; J. Richard Reiss, treas.; and Andrew Kushner, 707 Hazel St., secretary. Live nearby? Want to join? Look up Kushner.

As a member of the *Croyden MAC* (Surrey, England), Bob Ladd writes that he must pass on the news that the outfit has won the championship club title for the 5th time in the past 6 years . . . "four years in succession with rubber and gliders, one year off to get free flight gas under full control, and now it's (the championship) ours again." In the CMAC free flight wing loadings run from 2 to 4 oz./sq. ft., while power loadings hit 65-100 oz./cu. in. Average still air ratios—14 to 20:1.

The Life of an Undergrad! Remember the *Tech Model Aircrafters*, the M.I.T. club you read about in "Quarter Soarers" in AT not so long ago? Well, the club ran off a meet that was a doozie. We're a little late in reporting same, but we think you'll be interested in some of the special events and methods of computing.

A calm day, all day, not a cloud in the sky with temperatures in the high 80's—that was the setting for the TMA's 3rd annual free flight contest. Fifty-one contestants came from all over New England to compete for $250 worth of prizes. These contestants entered 93 models of all types: gas jobs, towline and hand-launched gliders and rubber powered ships. The flying site, good old Saugus field near the Revere Airport—corrugated with innumerable ditches to hold the sea water at high tide—this usually soggy salt swamp was dry as a bone all day long.

Events were typical of all *Tech Model Aircrafters* contests, something traditional plus something new. In the traditional hand-launched glider event, the club had a special Junior category in an effort to get the youngsters out, but their number was rather disappointing. However, the Senior entries were more numerous. One ardent speed merchant was heard to remark, "My arm's so tired from heaving this darn glider I won't be able to hang onto my 'D' job for a month!"

The new events were Half-A Payload with a 2-ounce dummy and P.A.A. rules.

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*LICENSED UNDER APEL-VENTNOR U. S. LETTERS PATENTS #2,126,304 of August 9, 1938 and #2,481,063 of September 6, 1949.

and a simple, but effective precision event for any and all types of free flight models, with an exact total of 4.5 minutes for three flights the goal. Winning times were very close to this figure—the first four places were within 3.5 seconds of it! The choice of prizes, namely an engraved trophy and merchandise for each first and merchandise for all the other places, was governed by the preferences given in the recent AT poll.

Myron A. Hoffman, president of the *Aircrafters*, said the winners seemed very pleased with the type and variety of their "loot." The entries in the precision event varied from towline gliders and rubber jobs all the way up to the big gas jobs and from comments by the contestants, the anything-goes-as-long-as-it's-close-to-4:30 category turned out to be a "natural."

As might be expected of any M.I.T. modeling club, a statistical breakdown of the flying was made with the following interesting figures:

	Precision	Payload	Jr. H.L. Glider	Sr. H.L. Glider	Total
1.	130	46	36	126	338
2.	2.2	4.2	6	7	3.6
3.	21.4	20.5	14	23	20
4.	55	55	17	61	50
5.	$110	$50	$30	$30	$220
6.	1 in 7	1 in 4	1 in 2	1 in 6	1 in 5
7.	58	11	6	18	93
8.	62	12	6+	20	100

(Key for above table: 1. Recorded Flights. 2. Av. Flights/Plane. 3. Av. Age. 4. % AMA Licensed—contest was not AMA sanctioned. 5. Prize Value. 6. Chance of Placing. 7. Entries. 8. % of Total.)

(Notes: 30% of models in Precision were not gassies; Precision Event was designed as free-for-all to lure all types of models off shelves, the 4.5 minute limit was designed to keep models from flying off the field.)

Quotes: J. A. W. Robertson, Box 174, St. Andrews East, Quebec, Canada: "The response was gratifying in answer to my request for correspondents (published in AT). I even received a telegram . . . it is a good way to get results. I also heard from London, England, much to my surprise. But I can do with a good deal more letters . . . since I wrote you the frigid weather up here has stymied control as far as I'm concerned—10 and 20 degree temperatures are just too cold on bare hands. Glow plugs are not improved either. So . . . I'll settle down to build up a supply of models for the summer. That article on glow plugs, incidentally, was great."

Earl M. Merrifield, Portland, Ore.: "Let me thank you for doing such a fine job on the Pitts Biplane model. Am sending along a print of Rudolf Friedrich's *Flying Clown* that I sent him (in Germany) several months ago. I sent him some glow plugs and this kit, and he was having great success with his home-made engines with the plugs, but had tried to fly the *Clown* on a 2.3 cc diesel (about .15 cu. in.) and had had no success. He was in the process of installing a larger engine when he wrote the last letter, so I am waiting to hear from him again. He lives in a small town and it would seem that there are either very few or absolutely no other modelers in the neighborhood.

"I'm back in business again—when I walked out of my workshop last night I had a finished *Shadow*, an almost completed *Lil Rascal*, and the basic fuselage of a *Dakota* all lined up on a 6-foot bench. We tested my *Super-Brigadier* free flight last week and have the Aero-Trol all installed and will fly radio control this week, come what may. Had a bad time with Jim Walker last week over this S-B.

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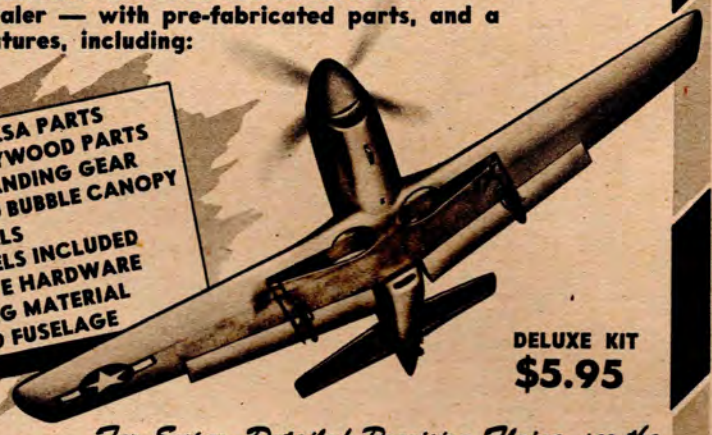
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"We were set up and flying when he arrived on the field and when he found that I had an escapement but no receiver in my model he came over with a complete McNabb unit ready to drop in. It took three of us to hold him off. The ship wasn't ready, we were trimming a vicious stall out of it and the model is extremely sensitive to rudder trim—but, primarily, I didn't want to spoil myself for a McNabb unit until I can afford one. Two of us have been working off and on for three years on this job, have our money tied up in it, and want to see it work first."

Bob H. Taylor, Box 646, Olivia, Minn.: "I live in a town of about 2,000 and we are quite proud of our achievements in the last 6 months—modelwise, that is. We formed a club and have 15 active members ranging from 10 to 35 years of age. Most of the boys who started had hardly seen a gas model. And none had flown a model with the exception of myself and my buddy, Jerry Hesse. He and I started the club and were able to get the support of the local Kiwanis who furnished us with a well-equipped room for work and meetings.

"The clubroom is open 3 nights a week and we have the club divided into three groups according to achievement levels in building. Jerry and I alternate supervising the classes so as to stay on speaking terms with our respective wives. To date every member has completed his first model and all but three have done some flying. Our program is confined to control line. We started all the boys on simple training types. I believe this is the reason we still have 15 hepped-up modelers instead of a bunch of fellows who want nothing more to do with an awfully expensive way of wasting time.

"We are the proud possessors of what we believe to be one of the finest flying fields in any town our size. Someone saw us flying on the local ball diamond and asked why we didn't get a field of our own. Of course you know the obvious answer—where? It happened that the fellow asking the question owned a nice piece of available property. We got together with our Kiwanis friends who in turn talked to the village street department and now we have a graded, rolled and soon-to-be-paved flying circle which will handle a model on 80-foot line. We have as many as 30 cars out to the field any time we start an engine. It would be nice if other small communities could do the same. There are a whale of a lot of good modelers that could be encountered in small towns who're waiting to be 'discovered.'"

Air Navy

(*Continued from page 62*)

Marine Aviation

The U. S. Marine Corps in battle carries its own umbrella. While the Army gets air cover from tactical units of the Air Force, the Marines have their own fighter squadrons for close support.

Marine aviators are trained to strafe the foe with bullets, bombs, and rockets just ahead of their advancing buddies on the ground—or in seaborne assault.

Amphibious attack is the Marine specialty. For a time, it was thought the need would diminish. Marine strength was being reduced. But Korea has shown that the power to seize beachheads still can be decisive. Marine planes blasted the way not only for their own ground units but for other United Nation troops.

In addition to fighter aircraft, the Marines have transport planes to supply both their ground and air forces.

Use of helicopters over the battlefield has been pioneered by the Marines for artillery spotting, rescue behind enemy lines, evacuation of wounded, and reconnaissance. Transportation of patrols to mountain tops, which otherwise would take hours to scale, is a typical 'copter mission in modern war.

Further use for amphibious assault is a Marine innovation, tested in maneuvers over the past two years. This will take larger 'copters than are currently on the Korean front in numbers. But watch the news.

No branch of the service instills greater pride, from its top General to its newest recruit, than the U. S. Marine Corps. Both for men and women, enlistments in the Regular and Reserve service of the Marines are still open.

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